EPSDT
Diagnosis & Treatment Costs: a five state analysis

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Prepared by
Health Services Research Institute
The University of Texas Health Science Center at San Antonio
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San Antonio, Texas 78284

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EPSDT DIAGNOSIS AND TREATMENT COSTS:

A FIVE STATE ANALYSIS

SEPTEMBER 1978

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Robert M. Brunell had the major responsibility for organizing the data and analyzing the individual state costs. Four second year graduate students in Health Care Administration from Trinity University completed the child by child analysis and coding: John F. Brecheisen and Joline R. Smith analyzed individual states, and Craig Hardy and Max L. Ludeke contributed to the overall groundwork and coding. Janet Lyn "B" Hibbs organized and coded data. Nancy Karam, Trisha Pederson, Rose Connors and Robert Herrera, from Data Processing, shared in the work of developing accurate data to run. Laverne Butler, Administrative Assistant to the Institute, was invaluable in planning and coordinating the resources of the Health Science Center. The skilled typing and patient table building of Ann Curtis, Jo Ivan, and Mae Rooks, literally gave this report its form.

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EXECUTIVE SUMMARY

This report provides program planners for child health assessment programs data about the Medicaid treatment expenditures paid in behalf of children screened and referred for treatment under the Title XIX Early and Periodic Screening, Diagnosis and Treatment Program (EPSDT). The data presented provides planning figures so that once a planner has estimated the number to be screened, the rate of referral (by age group), the percent referred that show for treatment, and the percent of those showing for treatment for whom payments are made, the planner may assess a dollar (in 1976 dollars) value to the *new costs of treatment* that will be incurred in an expanded program. Net new costs per problem by diagnostic grouping are provided.

Data Base

The Medicaid payment claims profiles were studied for a group of 1,713 children screened in the Title XIX Early and Periodic Screening, Diagnosis and Treatment Program between January 1, 1976 and April 30, 1976 and found to have problems referred from screening. These children were from Texas, Michigan, Iowa, Tennessee, and California. The data was originally collected as a part of the HEW-funded *Nine State Survey of Shows for Treatment* conducted by the Health Services Research Institute of The University of Texas Health Science Center at San Antonio. [The cost data was available for 91.5% of the children in the Nine State Survey from the same five states.]

There are several unique aspects of this study. First, the *Nine State Study* provided follow-up data on each child's problem indicating whether or not the child showed for treatment. This confirmation was obtained either from the *parent* or the provider to whom the child was referred. Second, the Medicaid claims files for each child were reviewed and abstracted by persons with training or experience in health care services so that unique combinations of treatment not otherwise noticeable by gross computer analysis could be found. This allowed a picture for each child of the treatment received during the time period prior to the screen, and time period after the screen to determine the amount of treatment that had been received both before and after the screening visit for the conditions that were referred by the EPSDT screen. This allowed the calculation of the approximate costs of treatment that were associated with the screening referral. These were termed screen-related costs. Since these costs were available both before and after the screen, ongoing costs of treating previously diagnosed conditions could be netted out to give a true incremental treatment cost of the EPSDT program.

The children in the data set had the following age distribution:

Years of Age	% of 1,713 Children
0 - 4	27%
5 - 9	29%
10 - 12	17%
13 - 21	26%

Although varying number of months of data was available from each state prior to the screen and after the screen, the average months per child available before the screen was 7.4 months and 10.5 months were available after the screen. The report contains first, an introduction and methodology discussion. Then results are discussed in three major areas: (1) the overall change in Medicaid costs; (2) the high cost problems in general; (3) the costs of treating screen related problems. The basic findings are presented below in reverse order from the way they were developed in the report.

Estimates of Costs for Program Planning Purposes

1. Based on the analysis of net new screen-related costs, Table ES.1 provides the cost estimates that are useful to program planners in program budgeting. The results are shown by age group and by dental, vision, and other problem category. The age groups 0-4, 5-12, and 13-21 represent the pre-school, elementary school age, and teenage populations. The dental and vision costs are separated from the other types of problems because they were the most frequent single category of problems referred from screening. Given the age distribution and referral rate of the children screened in the entire country during April 1976, and the cost per child with a problem from the sample in the study, the cost per child screened (first row of Table ES.1) was estimated by assuming that 30% of the children age 0-4 were referred to treatment, and 50% of the rest of the children were referred. The standard deviations in the data means that the 95% confidence intervals for the total dollar figures shown in Table ES.1 were plus or minus $5 to $10, depending upon the unit of discussion (per child or per problem).

   The overall result in this sample was that the net new treatment cost per child screened was $23 per child screened, with 40% expended for dental problems, 5.4% for vision, and 54.5% for other medical conditions. A different age distribution, referral rate, treatment rate, or payment rate, would result in a slightly different result in the total net treatment cost.

2. The overall percentage of problems getting to treatment in the data used for establishing unit costs was 71% of the problems referred. Then, only 73% of the problems showing for the treatment resulted in a paid claim. Therefore, only 52% of problems referred resulted in a paid claim over a period of 10.5 months after the date of the screening. The reason is unknown. Perhaps children were getting treatment from sources other than Medicaid providers (health departments, etc.). Perhaps the claims never make it through the claims payment process.

   Medicaid is getting a bargain (only 73% of treated problems resulting in a paid claim), but there may be a long term problem which could greatly alienate Medicaid providers.

3. The total screen related costs that occurred 10.5 months after screening were distributed between problem categories as shown in the pie chart of Figure ES.1. This indicates that a large segment of the screen-related costs are for dental care, vision, and eye problems of all kinds, genitourinary problems, tonsils and adenoids, digestive problems, mental and emotional problems, and hearing and ear problems (including otitis). Attempts at cost containment in EPSDT treatment should focus on these areas. Since the dental component is so large, special demonstration studies need to be undertaken to investigate ways to ensure greater dental treatment at lower cost per child. Either special contractual arrangements

TABLE ES.1

Estimates of Net New Medicaid Treatment Expenses Resulting From the EPSDT Program (1976 Dollars)

Treatment Cost Unit Deginition/ Category of Problem	Cost by Age Group 0 - 4	5 - 12	13 - 21
Cost per child screened*	$ 9	$36	$29
Cost per child with one or more problems	30	71	58
Amount which is for			
Dental	7	26	34
Vision	0	4	5
Other Medical	23	41	19
Cost per problem referred	17	39	30
Amount per problem for just these problems:			
Dental	28	41	54
Vision	0	22	23
Other Medical	18	53	20
Cost per problem showing for treatment for:	30	51	45
Dental	45	63	76
Vision	1	28	43
Other Medical	32	63	25
Cost per problem with costs paid	51	68	55
Dental	57	76	85
Vision	2	31	48
Other Medical	64	108	38

---

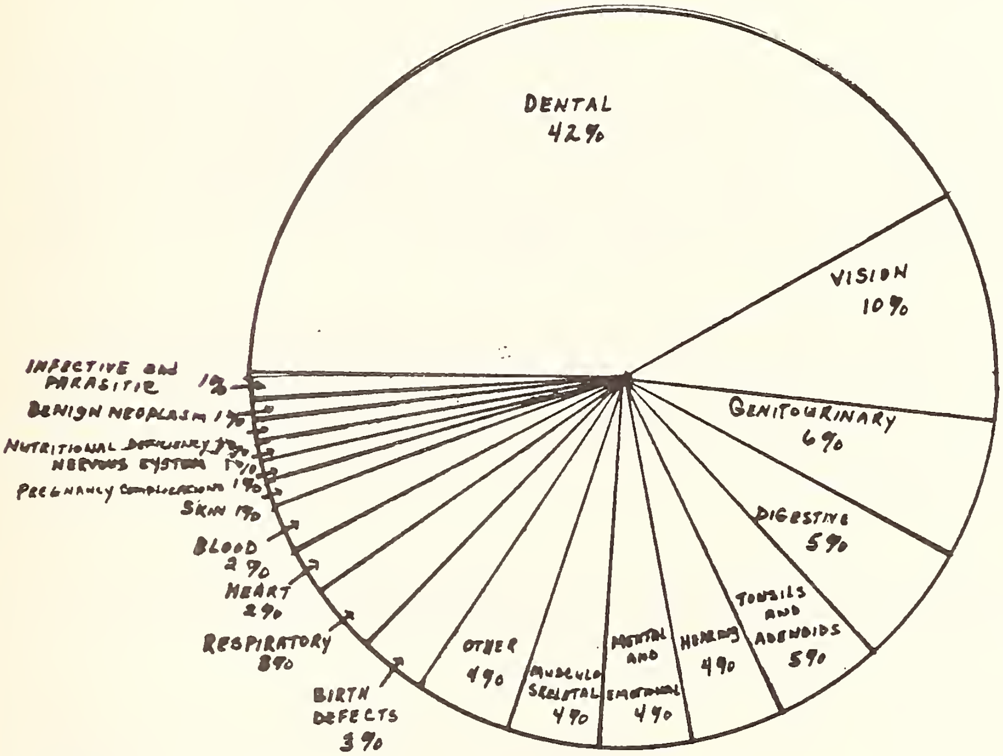
*Assumes 30% of the children age 0-4 who were screened were referred, and 50% of the children between 5-21 were referred. These assumptions were based on NCSS reports for April 1976.

with private dentists to treat groups of Medicaid children, or having dental treatment facilities at the screening site could lead to potential strategies for cost containment.

4. The total screen related cost that occurred after the screening was 40% of the total cost of the 1,713 children studied who had problems found in the screening. However, some of these problems were already receiving some care prior to screening, so that the screen related problems also generated 20% of the costs that occurred prior to screening. Therefore, the net new Medicaid costs related to screening findings could be estimated at 20% of the total Medicaid costs. This percentage was fairly constant between states, but would certainly vary with the level of dental care in the state prior to EPSDT.

Figure ES.1

Distribution of Total Screen Related Dollar Costs That Occur After Screening (Medical and Dental)



Medicaid Costs for Children

1. The annualized Medicaid costs after screening for medical costs only, was $165 for Texas, Iowa, and Michigan, and in these states, the annualized cost before screening was $155, showing only a $10 increase.

2. The annualized Medicaid cost after screening for medical plus dental costs in Iowa and Michigan (where these costs were directly comparable) were $166 per child, and the annualized cost before screening was $160.

3. Using data as appropriate for before and after screening comparison from all states, the average change in total Medicaid cost was $25, but the 95% confidence interval included a range ± $51. The medical cost increased $11 with a 95% confidence interval of ± $41.

4. Multiple Regression Analysis revealed that the only major predictor of the dollar amount of change for a child is the total annualized Medicaid cost prior to screening. Some children showed a great decline, and some children who had low cost before the screen had an extremely high cost after screening. This happened because certain types of high cost episodes of illness occur randomly through time and obscure the results of EPSDT screening.

   Other variables which added little to the predictive power of the equation, but that did show an effect, were the number of problems found in screening, the rural versus urban location, and age. Rural children showed less of an increase. Also, rural children had lower costs both before and after screening. The 13-21 age group showed a greater increase in costs, other things equal (but only when dental was included).

5. The distribution of costs between dental, medical ambulatory, and hospitalization costs changed when comparing the period after to the period prior to screening as follows:

Percent of total costs that were:	Time period in relation to the screen	
	Before	After
Ambulatory medical	48%	49%
Dental	5%	19%
Hospital	47%	32%

   In total, hospital costs were 47% of the total Medicaid costs prior to the screen, and 32% of the costs after screening. Even though the dental costs increased, the hospitalization costs declined. However, the children with high costs either before or after the screen primarily had hospitalizations, many of which seemed to occur randomly and without regard to the type of conditions upon which EPSDT screening is focused. These high cost items will be discussed next.

Children With High Costs Either Before or After Screening

Since the high cost episodes distort gross cost changes in Medicaid data, it was decided to review the high cost children's problems, regardless of screening outcomes. It was found that 9% of the children were generating 52% of the costs.

1. Children under five had high costs in pneumonia, bronchitis, hernia, and hydrocele.
2. Children age 5-12 had high costs in tonsillitis, mental and emotional problems and heart problems.
3. Persons age 13-21 had high costs in accidents, deliveries, and vision.

The rate of hospitalizations for certain types of conditions (tonsillitis) seemed to vary considerably between sites. Since these vary so much,and they are generating the high costs, attention should be paid to the potential impact of preventive programs,or program controls,on these high cost conditions. EPSDT does not, in general, generate treatment costs for these high cost episodes, but on the other hand, its activities may only peripherally serve to reduce them. Predictors of high cost children need to be developed.

Appendix E of the report contains details on each of the high cost episodes. Additional data is available on each hospitalization that occurred, but the scope of this study did not allow detailed analysis of that data. The implication of the high cost data are different by age group. There is need for continued research on identification of children age 0-4 who are at high risk of getting severe respiratory illness and trying to intervene in a multidisciplinary way in the lifestyle of the children.

The teens need family planning and related emotional counseling tailored to their needs in order to potentially prevent high cost episodes. Automobile accident prevention needs to be further studied and stressed if costs of high cost episodes are to be reduced.

In reviewing the high cost problems that were reported in the screen, and therefore considered "screen-related", a few were found that surely would have occurred regardless of the screen. They just were reported at that time, or just happened to become acute at the time of screening. This is partially accounted for in the program planning incremental cost estimates given earlier because the costs occurring prior to screening were subtracted from the costs occurring after screening for screen related problems to get a net new cost. However, if a case of pneumonia was discovered for which there were no costs before, it would get counted as a screen related net new cost. The impact of this should be minimal according to our methodology, but without analysis beyond the scope of this study, could not be completely eliminated.

Conclusion

The overall conclusion is that EPSDT generates very little additional Medicaid screen related treatment costs (approximately $23 per child screened) and that, in fact, the distribution of total Medicaid costs for children shifts away from hospitalization and toward ambulatory care. In the analysis of the impact on overall Medicaid cost per child (on an annualized basis) there was no statistically significant difference in Medicaid costs,and children definitely got more dental and vision care. An analysis of the high cost episodes indicate areas for health (not just EPSDT) program attention in the areas of respiratory illness in young children, tonsillitis in school aged children, and family planning in the teenage population. The high percent of screen-related treatment dollars going for dental care indicates that demonstrations of cost effective ways to improve child dental health are needed.

The methodology of the study got complex because of the varying availability of data in each state. Since it was complex, it is discussed after the conclusions for the benefit of those who would like a clarification on the data base and how it was pieced together to provide a meaningful set of numbers. The following pages of the Executive Summary contain the highlights of the methodology, but are not crucial to an understanding of the conclusions presented above.

Methodology Summary

The Nine State Survey examined a randomly selected group of children from rural and urban settings who had been screened in the four to six month period between January 1, 1976 and April 30, 1976 (or June 30 in Tennessee) and found to have at least one problem. Dental, vision, hearing, hemotocrit, and up to four other problems (identified by ICDA code) were followed for each child to identify which conditions reached treatment within four months of referral and which did not reach treatment.

At the time of the Nine State Survey, Medicaid cost data was requested from each state for the year before and the year after the screening period in order to track the treatment costs for each screen-related problem and to tie them with the Nine State's information on shows for treatment. Five states, Texas, Michigan, Iowa, California, and Tennessee supplied data covering 93.8% of their children in the original sample (see Table ES.2). Of these, 1,755 cost records, 15 were excluded because of errors in problem definition, or two people's costs' appearing on one record, and 37 were omitted for ease of analysis who had no recorded age. The final size was 1,713.

The cost data from each state covered a different period of time. California's information was in two sets, each one with a different time frame. One set included four of the five state sites, and the second set was for Contra Costa County, which was therefore considered as a sixth state. Tennessee and California only provided their data from January 1, 1976, the beginning of the screening period, which would not permit a cost analysis before screening in these two states. Four states provided Medicaid cost data before the screening period and six states afterwards.

Table ES.2

SAMPLE SIZE

State	Site	Original 9 State Sample	Cases with Complete Medicaid Data	Number Omitted	Final Sample Size	Percentage of Original Sample
Texas	San Antonio	68	66	0	66	97.1%
	Beaumont	80	77	10	67	83.8%
	Lubbock	67	60	1	59	88.1%
	Eagle Pass	79	78	1	77	97.5%
	Fort Worth	74	70	1	69	93.2%
Texas Totals		368	351	12	338	96.3%
Tennessee	McNairy	26	72	1	71	82.6%
	Hardin	60				
	Washington	80	71	0	71	88.8%
	Knoxville	80	72	2	70	87.5%
	Nashville	81	67	3	64	79.0%
	Memphis	80	74	2	72	90.0%
Tennessee Totals		407	356	8	348	85.5%
Michigan	Grand Haven	88	85	1	84	95.5%
	Flint	94	91	0	91	96.8%
	Grand Rapids	100	92	2	90	90.0%
	Allegan	89	87	1	86	96.6%
	Detroit	68	68	1	67	98.5%
Michigan Totals		439	423	5	418	95.2%
Iowa	Clay	10	10	0	10	100%
	Maquoketa	16	15	0	15	93.8%
	Cedar Rapids	44	43	2	41	93.2%
	Council Bluffs	32	32	1	31	96.9%
	Davenport	168	168	0	168	100%
	Ottumwa	17	17	0	17	100%
Iowa Totals		287	285	3	282	98.3%

Table ES.2

SAMPLE SIZE (continued)

State	Site	Original 9 State Sample	Cases with Complete Medicaid Data	Number Omitted	Final Sample Size	Percentage of Original Sample
California	Los Angeles	77	67	2	65	84.4%
	Contra Costa	77	67	2	65	84.4%
	San Bernadino	73	68	3	65	89.0%
	Sonoma (R)	66	64	4	60	90.9%
	Ventura (R)	78	75	3	72	92.3%
California Totals		371	341	14	327	88.1%
	STATES					
	Texas	368	350	12	338	91.8%
	Tennessee	407	356	8	348	86.8%
	Michigan	439	423	5	418	95.2%
	Iowa	287	285	3	282	98.2%
	California	371	341	14	327	88.1%
5 State Totals		1,872	1,755	42	1,713	91.5%

Each final statement of cost included two elements, the child's total costs, and the time span that had been examined for them. Because two time periods were examined for each child, a maximum of one year before the screen and a year after, each child's costs were separated into two groups covering two individual spans of time. Their costs before screening were added between the earliest date of service with which their state began their overall listings, and the child's screening date. This span of time was termed the estimated state service range before screening and was expressed in months. Each child's costs before screening could be expressed as $X over Y months of potential service. A similar set of calculations developed an estimated state service range after screening which is the time between a child's screening and the end of the state's listing period within which to examine that child's costs.

When payment date's were used by states, instead of service dates, to begin or end their listing period, a corrected service date was used instead of the payment dates to calculate the span of time included in a state's listing. This date was selected as the point by which 80% of the service occurred which was paid by the state's payment date.* Since the screening date was a date of service, these corrections were needed to allow each range to begin and end with a service date. Payment dates and service dates would not be compatable within a single range.

These costs per child over their state range of time include a built in, but unspecified, period of ineligibility for each child. While the costs for any one child would be skewed by not knowing their individual periods of eligibility, the costs for a group of children would accurately reflect the Medicaid dollars spent for that group with their ineligibility averaged out across children. This calculation would be the most realistic figure for planners.

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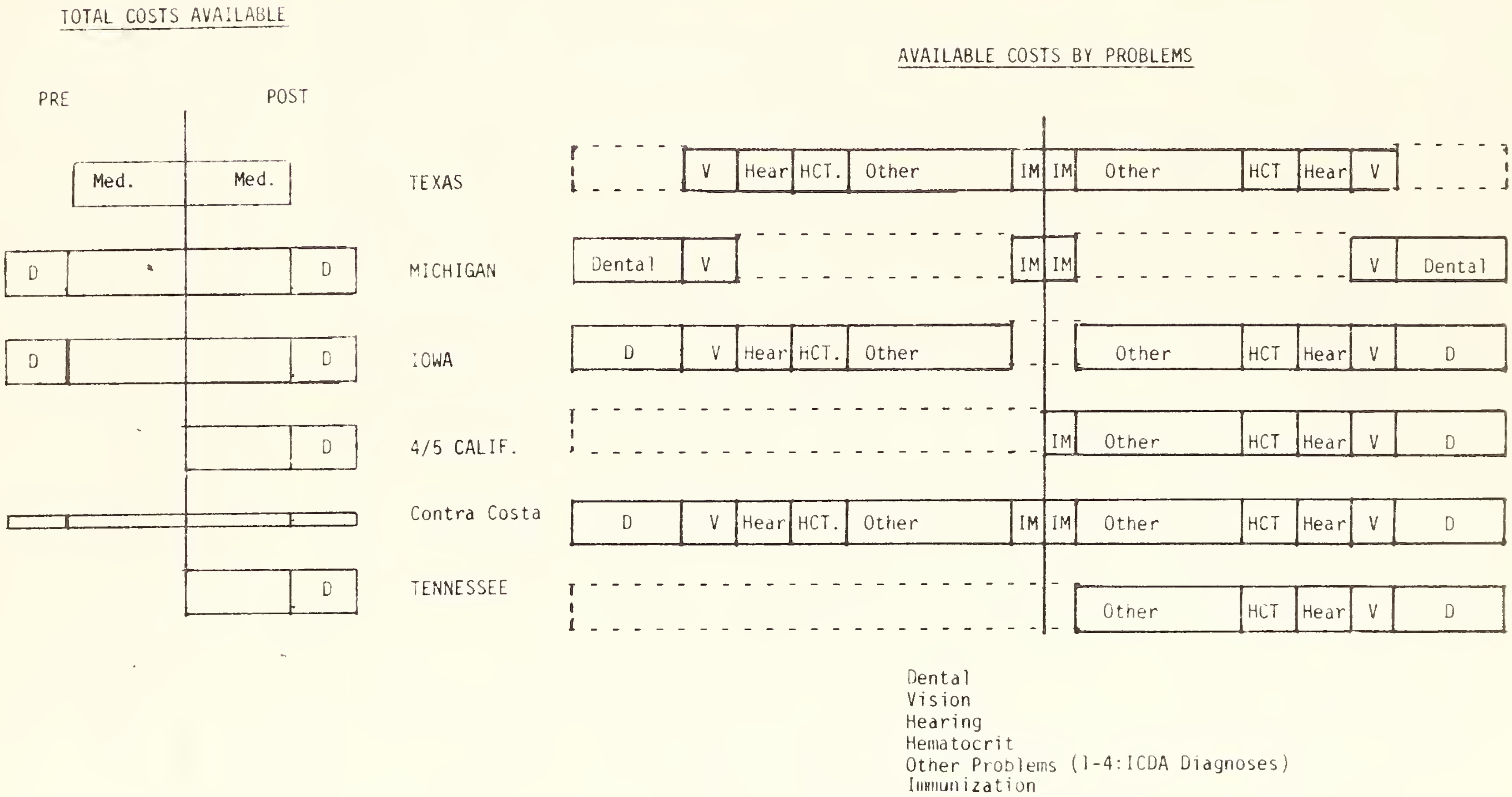
*A detailed discussion of the rationale for this calculation is contained in the Methodology section.

Within these state differences in the time ranges of their data are differences in the data themselves (Figure ES.2). The Texas data included only medical costs, not dental costs, which limited Texas' comparisons with other states' total costs. Dental and vision costs were the only specific problems that could be tracked through the Michigan data. While the total Michigan costs were included, the data tape they furnished did not include ICDA codes which limited specific problem analysis. Immunization costs were not accessible for Iowa and Tennessee. When costs were considered for any screen-related problem, "problems" were more precisely considered as problem areas, since only diagnoses could be tracked with certainty, not individual conditions. A screen-related respiratory problem, for example, could be treated and another appear in its place much later without changing the codes on the cost data which identify only the diagnoses, not the time limits of specific conditions.

The data from California and Tennessee reflected either costs or no costs for a problem after screening, since no cost data was available before the screening period. However, the other four states' inclusion of data from both before and after screening allowed a description of four patterns of costs for each problem.

Type 1 costs included children whose screen-detected problem generated no costs before screening, and some costs after the screen.

Figure ES.2


TOTAL COSTS AVAILABLE
PRE
POST
Med.
Med.
D
D
D
D
D
D
AVAILABLE COSTS BY PROBLEMS
TEXAS
MICHIGAN
IOWA
4/5 CALIF.
Contra Costa
TENNESSEE
V
Hear
HCT.
Other
IM
IM
Other
HCT
Hear
V
Dental
V
IM
IM
V
Dental
D
Dental
Vision
Hearing
Hematocrit
Other Problems (1-4:ICDA Diagnoses)
Immunization

Type 2 costs identified those screen-related problems without any Medicaid costs before or after the screen.

Type 3 costs reflected problems for which there were costs before the screen, but no costs afterwards, despite the problem's being identified as needing treatment at screening.

Type 4 costs identified screen-related problems with costs both before and after screening.

Type 5 costs. A fifth type was added to include those rare costs that could not be tracked. For example, a few problems had no verbal description on the Nine State code sheets, and an ICDA code of 796, "other".

Because each child had an individual range of costs before and after screening, accentuated by the differences in the state data spans, a formula for annualizing costs was used to allow comparisons across children and states. For states reporting costs before screening, each child's total costs before their screen were divided by the number of months in their state service range before the screening to produce a monthly average cost which was annualized by multiplying by twelve months. This figure was termed the total annualized costs of before screening (TACB). To include Texas in cross-state comparisons, a second calculation figured the total medical annualized costs before screening. It was computed in the same manner as the total annualized cost, but without dental cases (total medical annualized costs before screening, TMACB).

All costs before the screen could be considered random, not effected by whatever problems were noted at screening, and therefore were annualized appropriately. However, once a problem was detected at screening, and referred for treatment, its specific costs would be more likely clustered near the screen rather than at the end of the year. To annualize all costs after screening in the same direct manner used on costs before the screen would be likely to inflate the total in many cases, treating the screen-related costs near the screen as if they should appear evenly throughout the year. For costs after screening, those costs generated by screen-related problems were subtracted from the total costs after the screen, and the balance was annualized. These annualized non-screen-related costs were then added to the unadjusted screen-related costs to compute the total annualized costs after screening (TACA). To include Texas, a similar calculation was made for all states using only medical costs (total medical annualized costs after screening, TMACA). A final calculation, the change in annualized totals, was made to express the dollar change in cost from before to after screening for both the total annualized costs, and the total medical annualized costs (change in annualized total costs, CAT, and change in annualized total medical costs, CATM).

CHAPTER 1

Introduction

The Health Services Research Institute at the University of Texas Health Science Center has been collecting and analyzing evaluation and demonstration data concerning the Title XIX Early and Periodic Screening, Diagnosis and Treatment Program (EPSDT) since July, 1972. Part of these studies have included analysis of the impact of EPSDT on the cost of treatment as well as the costs of deliverying EPSDT services. Treatment costs were reported in the Eight State Study of EPSDT released as an MSA information memorandum MSA-IM-74-11 on February 21, 1974 as follows:

> "For the 349 screening findings in our sample which had Medicaid paid claims related to those findings, the average cost of treating the finding during the three months after screening was $49.50 per abnormality. For a small number of those children, however, care was already being received for that problem during the three months prior to screening; when the dollars spent on those individuals with prior care are allocated to all abnormalities, it comes to $7.95 per abnormality. Therefore, it can be said that the net increase in cost for treatment attributable to EPSDT findings is $41.55 per finding with related claims. This figure varied between states--from $17 in Virginia to $77.44 in Iowa.
>
> "Since less than half of the abnormalities had related claims after screening, the cost increase on a 'per abnormality found' basis is only $13 per abnormality found (for which a claims file was checked).
>
> "It should be cautioned that these figures were based on a small 'sample' not randomly drawn. Thus, the figures should be considered as only rough estimates of the cost of treatment to Medicaid."

In subsequent demonstration projects that were funded by the Research and Demonstration division of the Social and Rehabilitation Service (now part of Health Care Financing Agency) treatment costs are reported for the Contra Costa

County California demonstration project in the report title Contra Costa County EPSDT Demonstration Project (April 1978, Health Services Research Institute) in a section titled "Study of the Medicaid Cost Impact of the EPSDT Project". There it concluded that:

> "Dental costs for each child getting to dental treatment and for whom a Medicaid claim was known to have been paid increased by $120 per child, and the medical costs increased approximately $40 for each new medical condition reaching treatment and getting a paid claim. However, since only half the children reaching treatment resulted in a paid claim, and since the treatment rate was fairly low--60% for dental--and the referral rate was low due to a retest-before-referring policy, and only 30% of the eligible population was reached, the projected cost per eligible child was minimal. The severe dental problems were three times more costly to treat than the mild problems, indicating a cost benefit possibility in early treatment and prevention of severe dental cases.
>
> One child in the sample with a G6PD enzyme deficiency had a large reduction in cost after the finding of the problem. The high cost items varied by age group and included bronchitis, gastritis, tonsillitis, pneumonia, fractures and pregnancy. Unless these can be prevented through a concentrated health program, the Medicaid cost will not show much decline since only a few children with high costs can distort the cost impact of other activities. The apparently random nature of the occurrence of such problems means that high cost treatment will occur both before and after screening, so any cost changes resulting from EPSDT are obscured by the large dollar items. The pattern of care received, in children with problems, however, apparently shifted away from acute type problems to treatment of more chronic type conditions.
>
> Cost planning estimates were provided showing that even if 100% of those needing treatment received it, the cost of treating screening discovered conditions would only be $44.36 per child, assuming the rate of findings found in Contra Costa, or $30 per screen* in a population with an age distribution with one half the children under age 5. Since, however, EPSDT is primarily a preventive effort, the costs of the outreach, screening, immunizing and follow-up should far outweigh the changes in cost of Medicaid reimbursed treatment."

The National Child Day Care Association EPSDT project generated treatment costs as described in the evaluation report titled" The National Child Day Care Association EPSDT Demonstration Project: Implementation of Comprehensive EPSDT in a Day Care Association - FINAL EVALUATION" (March 1978), Health Services Research Institute. The conclusion about costs states that:

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*There were 8,900 screens and 6,000 children.

> "The Medicaid payment claims for all 124 Medicaid children with Medicaid profiles and screened in the National Child Day Care Association between September 1975 and March 1976 were studied to determine the impact of the project on the payments made to physicians, dentists, outpatient clinics, and hospitals in behalf of the children. It was found that because of a low rate of dental referrals getting paid claims in the file, and most importantly because of the random nature of the many high cost expenditure items, there was a negligible overall impact on the Medicaid treatment payments to providers. Other agencies may have absorbed the cost due to poor billing, but nevertheless, the Medicaid treatment costs are, if anything, lower after the screening in spite of a general 12% inflation in medical care prices.
>
> Such problems as fractures, diabetes, and influenza, which lead to hospitalization, will not be affected by EPSDT but can happen randomly in a small sample--distorting the overall picture of the EPSDT cost impact. In fact, unless EPSDT can act to reduce the rate of hospitalization for accidents, flu, uncontrolled diabetes, etc., it is unlikely the short term cost reductions can occur."

The data presented in this report, although in no way definitive, adds depth to the data base on costs. Before describing the study, it should be pointed out that HSRI staff are currently working on larger sets of treatment cost data available from over 3,000 children in the Dallas area, and will soon be working on data available from the Pierce County Washington area. However, the data reported here is unique in that coders reviewed, by hand, Medicaid files to determine costs that were screening related. It is nearly impossible to program a computer to perform such a complex task, so while the data base is small, it is more complete than any other known analysis of such data.

The data base for this study was generated as a part of a Nine State study of shows for treatment conducted by the HSRI in 1977, in which children with problems found in screening were selected in nine selected states (three urban and two rural areas per state). The tracking of problems was done by program persons on-site in each locality, and were spot checked by an HSRI review team. A report was presented describing the rate of shows for treatment (summary is attached), but time was not available for an analysis of data requested from each state at the time of the study concerning treatment costs. Only five of the nine states had capability in their claims data system of retrieving the data, but, as described in the Methodology, these states were unable to provide the data in a completely uniform manner. Some states reported only costs after screening; some report only medical costs, and one reported medical costs, but only dental costs for children with dental problems found in the screen. Regardless of these problems, useful results emerge about the details of costs related to the screening problems. The report will follow the following plan. The methodology will be described for data collection, coding, and a condensing in Chapter 2. The results concerning the impact of screening and finding children with referrable conditions in the overall Medicaid treatment cost will be presented in Chapter 3. Then, since the costs impact is statistically negligible, children in the study who had problems costing more than $500 during the time period of analysis are reviewed in detail as Chapter 4 to study those conditions which generate high costs in Medicaid children under age 21. Then the results on the treatment costs for screen related problems (i.e., problems reported and referred out of screening) are presented. Each chapter will contain its own conclusion. These conclusions are summarized in the Executive Summary.

CHAPTER 2

Methodology

Sample Selection.

The method for selecting the sample children is described in the Nine State Survey (see Appendix A , pp. 9-14). A question about this process has been raised by the Children's Defense Fund in their report EPSDT: Does is Spell Health Care for Poor Children? Footnote 10 (pp. 140-141) implies that the local directors chose the sample, possibly biasing the results. However, the HSRI Nine State Survey (pp. 12-14) describes the process by which a random sample of children was designated. They were randomly selected from complete lists of all children screened between January 1 and April 30, 1976 (except for Tennessee whose screens ran through June 30, 1976).

This process selected 1,872 children from Texas, Tennessee, Michigan, Iowa, and California. Within these five states, Medicaid cost data was available for 94% of the children. Table 2.1 lists the final sample size within each state and site. Table 2.2 describes the conditions under which any cases were excluded. Of these 1,755 complete Medicaid cost records, 15 children were excluded because either more than one person's charges appeared on their record, or other notations were inappropriately labeled "problems". For ease of analysis, 37 children with missing ages were excluded as well. The final sample size was 1713, 91.5% of the original Nine State Sample.

State Medicaid Data.

Texas, Tennessee, Michigan, Iowa, and California furnished their basic cost data, uniquely composed by state. Data was requested at the time of the Nine State Survey (December 1976) for one year of service before the screening period, and as long after the screening period as possible. This request should have allowed

Table 2.1

SAMPLE SIZE

State	Site	Original 9 State Sample	Cases with Complete Medicaid Data	Number Omitted	Final Sample Size	Percentage of Original Sample
Texas	San Antonio	68	66	0	66	97.1%
	Beaumont	80	77	10	67	83.8%
	Lubbock	67	60	1	59	88.1%
	Eagle Pass	79	78	1	77	97.5%
	Fort Worth	74	70	1	69	93.2%
Texas Totals		368	351	12	338	96.3%
Tennessee	McNairy	26	72	1	71	82.6%
	Hardin	60				
	Washington	80	71	0	71	88.8%
	Knoxville	80	72	2	70	87.5%
	Nashville	81	67	3	64	79.0%
	Memphis	80	74	2	72	90.0%
Tennessee Totals		407	356	8	348	85.5%
Michigan	Grand Haven	88	85	1	84	95.5%
	Flint	94	91	0	91	96.8%
	Grand Rapids	100	92	2	90	90.0%
	Allegan	89	87	1	86	96.6%
	Detroit	68	68	1	67	98.5%
Michigan Totals		439	423	5	418	95.2%
Iowa	Clay	10	10	0	10	100%
	Maquoketa	16	15	0	15	93.8%
	Cedar Rapids	44	43	2	41	93.2%
	Council Bluffs	32	32	1	31	96.9%
	Davenport	168	168	0	168	100%
	Ottumwa	17	17	0	17	100%
Iowa Totals		287	285	3	282	98.3%

Table 2.1 cont.

SAMPLE SIZE (continued)

State	Site	Original 9 State Sample	Cases with Complete Medicaid Data	Number Omitted	Final Sample Size	Percentage of Original Sample
California	Los Angeles	77	67	2	65	84.4%
	Contra Costa	77	67	2	65	84.4%
	San Bernadino	73	68	3	65	89.0%
	Sonoma (R)	66	64	4	60	90.9%
	Ventura (R)	78	75	3	72	92.3%
California Totals		371	341	14	327	88.1%
	STATES					
	Texas	368	350	12	338	91.8%
	Tennessee	407	356	8	348	85.8%
	Michigan	439	423	5	418	95.2%
	Iowa	287	285	3	282	98.2%
	California	371	341	14	327	88.1%
5 State Totals		1,872	1,755	42	1,713	91.5%

Table 2.2

CASES OMITTED

State	Site	HSRI ID	Reason
Texas	Beaumont	1C96	Only Problem Listed as "Moved"
		1C97	Only Problem Listed as "Moved"
		1C98	Only Problem Listed as "Moved"
		1C99	No Date of Screen
		1D00	No Date of Screen
		1D11	Dental Problem Only (No Texas Dental Cost Data Available)
		1D24	Never Screened
		1D25	Never Screened
		1D26	Never Screened
		9	
	Eagle Pass	1C13	Dental Problem Only
	Texas Total	10	
Michigan	Grand Rapids	5R66 5S12	Same Recipient Number
	Grand Haven	5T35	Two Month Old Child with Adult Costs
	Allegan	5S73	Six Month Old Child with Adult Costs
	Michigan Total	4	
Iowa	Council Bluffs	7A59	Some of Mother's Charges Added to Child's Record
Totals	Texas	10	
	Michigan	4	
	Iowa	1	
	Five State Total	15	

for twelve months of service before the screening period and at least six months afterwards. However, since the states were not specially funded to conduct a thorough analysis and develop special programming, they graciously provided what cost data they could. Each state scanned a different period of time and reported different patterns of information elements(Table 2.3).

Tennessee and four of the five California sites provided data that began in January 1976, the first month of the screening period, allowing only post-screening comparisons. Four essential data elements were requested:

1. Patient Identification: Name, Medicaid number or recipient number.
2. Dates of Service.
3. Description of Service: A verbal or coded procedure along with an ICDA diagnosis. The diagnosis, often aided by the procedure description, is necessary to tie costs to their identified Nine State Survey problems. (Only the Michigan data lacked an ICDA code on the tape we received.)
4. Amount Paid. (Iowa and California added the original billed amount.)

Limitations of These Data.

The only data available for all five states was the total medical costs (excluding dental) after screening and the vision costs after the screen. The configurations of state data are unique. While each state displays its own strengths, their features do not fit together evenly across states to permit an entirely comparable analysis. Joining the Nine State Survey data on children's problems and their shows for treatment* with their cost data also presents limitations across cases requiring that screen-detected symptoms be recast into diagnostic categories sensitive to any subsequent costs. These limits on comparison divide into four main groups: the time frame limitations across states, the problem of having no eligiblity information for any state, the limitations from

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*Already on computer file.

Table 2.3

STATE MEDICAID DATA COMPARISON

Screening Period
Jan. 1 1976-April 30,1976
(Through June 30, 1976 for Tenn.)

	CORRECTED SERVICE RANGE*		COST INFORMATION		ICDA DIAGNOSIS		MEDICAL PROCEDURES					
	Before Screen Per.	After Screen Per.	Total Bill	Total Paid	Code***	Verbal Description	Code We Can Read	Verbal Description	Dental	Pharmacy	Immuniz. Procedure	Remarks
TEXAS**	Jan. 1,'75 May 6, '75	Jan.17,'75	NO	YES (No Dental)	YES	YES	YES	YES	NO	YES	YES	Excellent
TENNESSEE	Jan.1,'76	Jan.24,'77	NO	YES	YES	NO	NO	NO	YES	YES (Out-Patient Only)	NO	Good
MICHIGAN	Jul.1,'75	Dec.19,'76	NO	YES	NO	NO	YES	YES	YES	NO (Incomplete)	YES	No ID Confirma-tion
IOWA	Jan.1,'75	Oct.16,'76	YES	YES	YES	NO	NO	NO	YES	YES (Out-Patient Only)	NO	Hard to Read
CALIFORNIA (other)	Jan.1,'76	Dec.1,'76	YES	YES	YES	NO	YES (For Most Procedures)	NO	YES	YES	YES	Hard to Read
CONTRA COSTA, CALIFORNIA	Jul.9,'75	Jan.2,'77	YES	YES	YES	YES	YES	YES	YES	YES	YES	Excellent!

*When a state selected cost data by its date of payment, a service date was calculated for that state which included 80% of the services paid by the state's date of payment.

**The basic Texas data was augmented by additional data extending its range back to Jan. 1, 1975 in some cases.

***All that is necessary. We have ICDA code books.

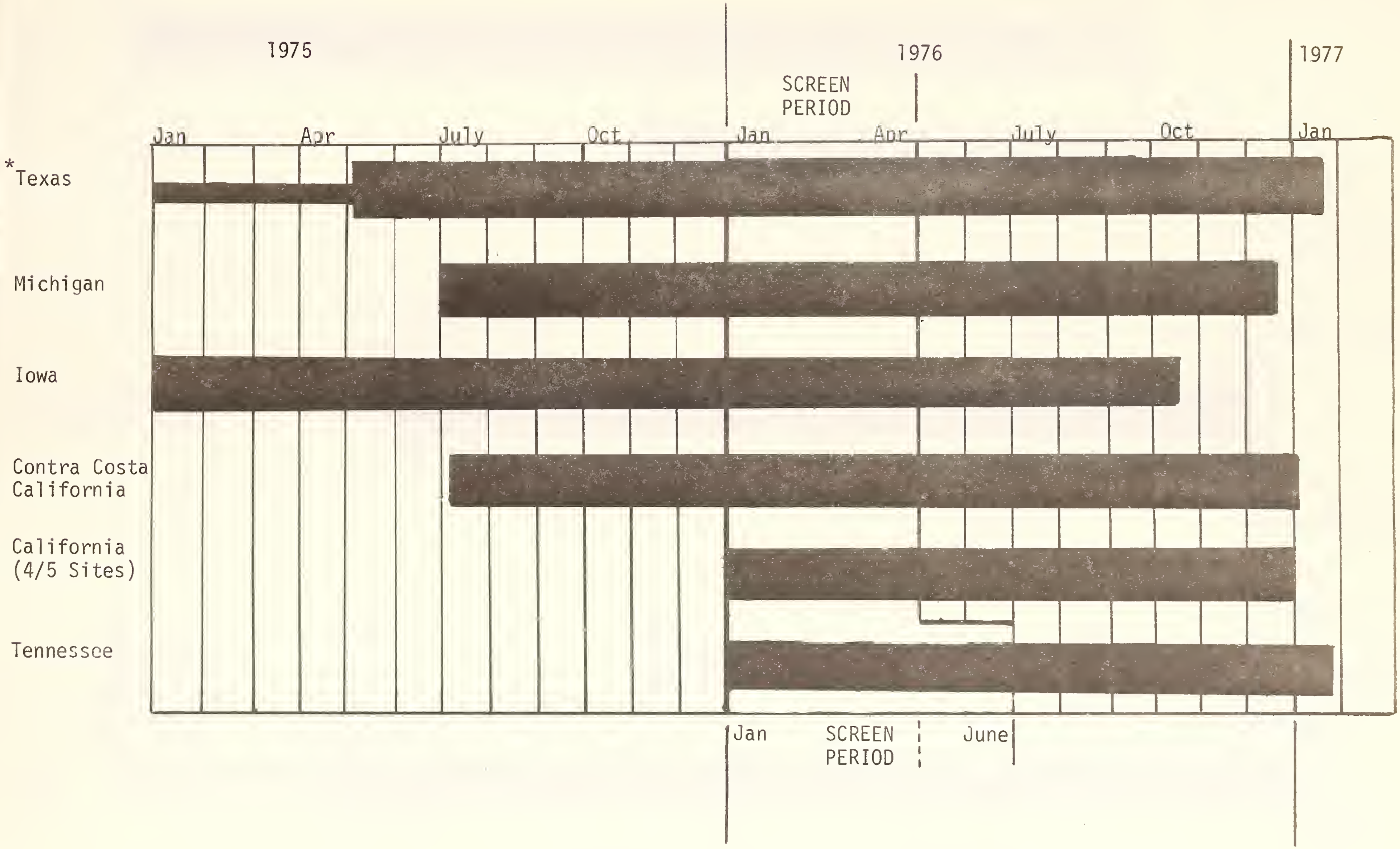
state-to-state on the types of problems accessible to cost analysis, and the difficulties inherent in defining a "problem" in any state and tracking its costs.

1. Time-frame Limitations. Each state examined a different period of time (Table 2.4): The data from Tennessee, and four of the five California sites (except Contra Costa) permitted no cost analysis before the screening period. Because the Contra Costa data covered a different time period than the rest of California, it was considered as a separate state for the analysis.

To compensate for these unique spans of state cost data, individual ranges in months were calculated for each child before and after screening to identify the potential span of cost information available for them. Each child's costs were divided by this range of month of available state data and multiplied by twelve months to produce an annualized cost comparable across states.

Each state used one of two criteria for selecting time periods before the screen. Either the date of service, or the date of payment, was used to begin a range of cost information. For California, Tennessee, Michigan and Iowa, their first cost information was selected by a date of service, and this date was considered the state's initial service range date before screening. The number of months between this service date and an individual child's screen was that child's state range before screening. Both ends of the range, the state's service service range date before screening, and the screening date, are service dates and are therefore compatable with one another. However, Texas and Contra Costa data was selected by a payment date rather than a service date. To bring these initial payment dates into consistent terms with the screen (a service date) a correction was made for them by selecting the date of service by which most services (80%) were estimated to have been performed to be paid by that state's initial date of payment (Table 2.5) All services in Texas and Contra Costa during the first two months of available data were assessed for the lag between

Table 2.4: MAXIMUM STATE COST INFORMATION AVAILABLE ± 1 YEAR OF SCREENING
(Dates of Service in the Sample)



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*Some Texas records had added cost information beginning on 1 January 1975.

Table 2.5: CORRECTED STATE SERVICE RANGES (PART I)

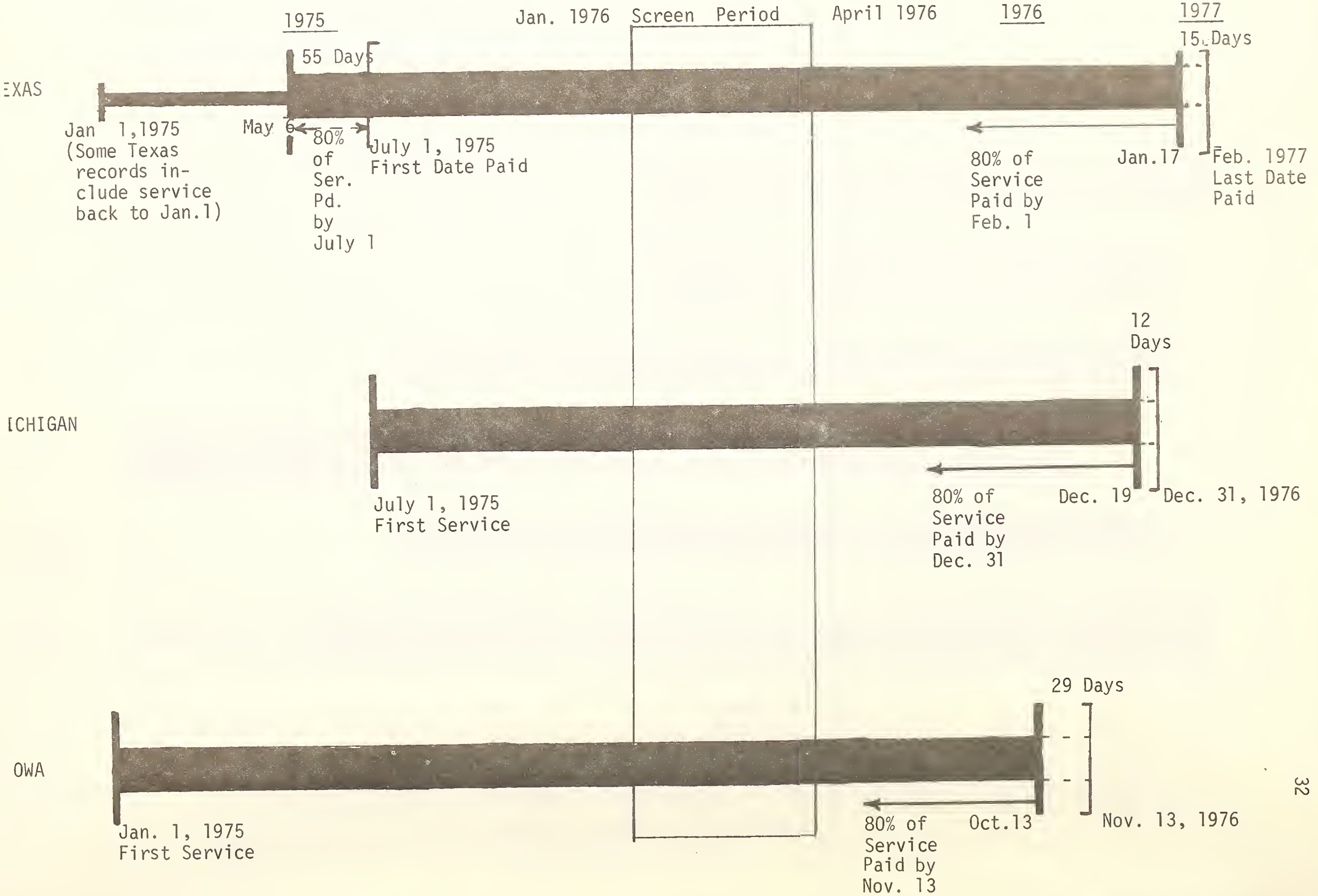
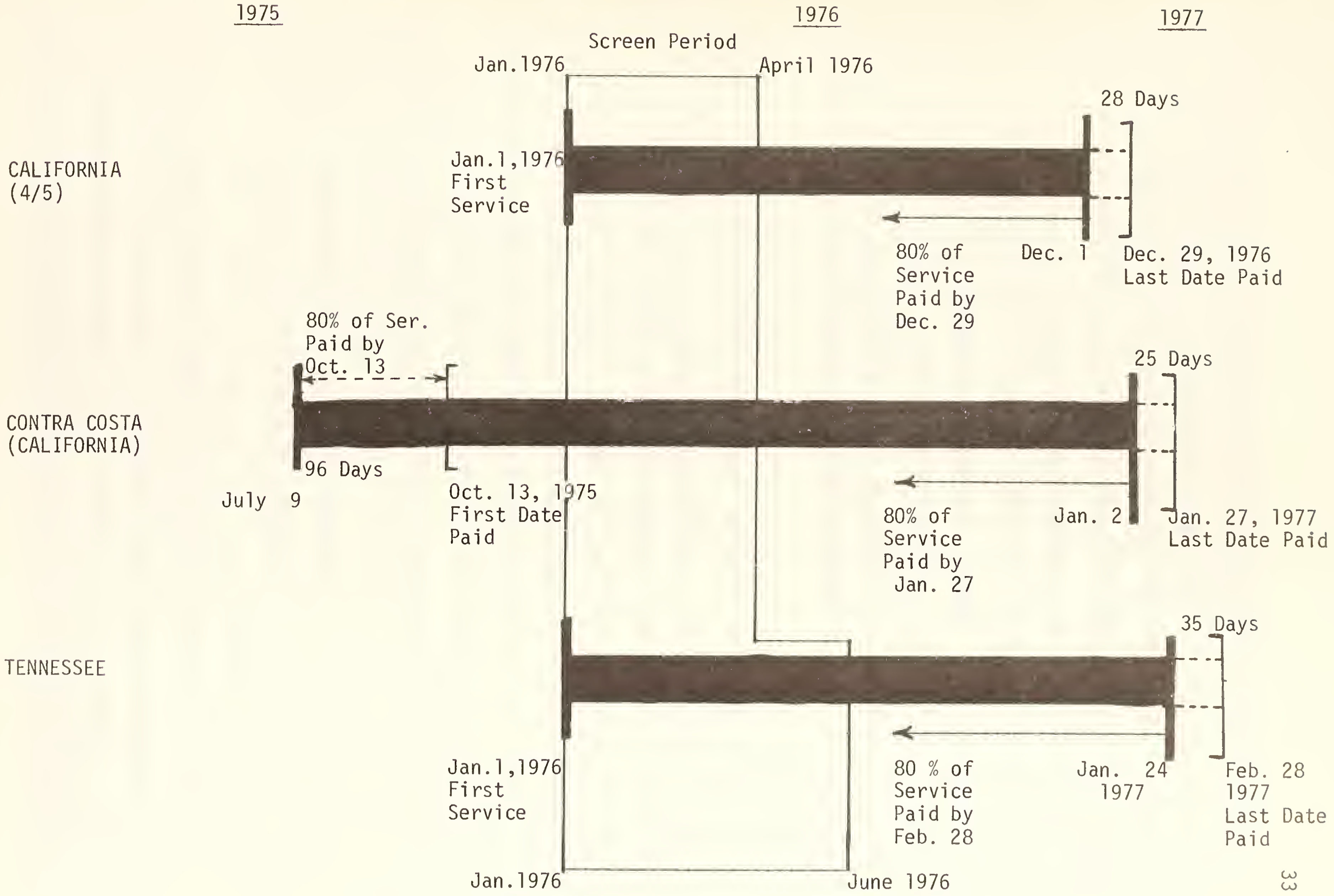


Table 2.5: CORRECTED STATE SERVICE RANGES (PART II)



service and payment. A date of service was then selected as the estimated initial service date for computing the state's service range before screening. Eighty percent of the services that were paid by the state's initial date of payment were performed after this estimated initial service date. For example, much of the Texas data was selected by payment dates of July 1, 1975 or later. It was found that 80% of the services paid in July and August had a lag of 55 days or less between the service and its payment, so a date 55 days before July 1st was selected as the Texas service range date before screening. Therefore, 80% of the services would have occurred after May 6, 1975 to have been paid by July 1st. Therefore, May 6, 1975 is shown on Table 2.5 to be the Texas estimated initial service date.

The final data after screening for all six states was selected by payment date. To correct for this, a similar process was used to select a state service range date after screening to include 80% of the services paid by the state's cut-off date for recording payments. For example, in Contra Costa, the last data received was selected by a payment date of January 27, 1977. In the last two months of data, the lag between service and payment was greater than twenty-five days for 80% of the services. Therefore, January 2 was designated the state estimated final service range date after screening, twenty-five days before the 27th. This was a date by which 80% of the services in Contra Costa would have occurred to have been paid by January 27th. For children in Contra Costa, the number of months between their screen and January 2, 1977, was considered their state range after screening.

Each child, therefore, had two service ranges in months, one to express the interval between the beginning of their state's data retrieval period and their individual screening date, and a second range for the span after screening. These individual month ranges served as denominators by which to divide costs into comparable monthly averages which were then annualized (Table 2.6).

2. Limitations of Elibibility. The original intent of the study was to offer average Medicaid costs per child during their period of coverage, that is, assuming continuous eligibility. This idea has been modified both to meet the limitations of the data as well as to conform to an aspect of planning reality.

No state included month-by-month eligibility information for its children. Initially, some compensation for this gap was intended. A second set of ranges was to be devised for each child, spanning the period between their earliest claim before the screen and the screen and a matching range from the screen to their latest claim. This child's range was intended to offer a second period of months as a denominator by which to divide their costs, complementing the state ranges and ensuring that long periods of ineligibility would be less likely counted, at least at the head and tail end of their records. However, while this would limit a child's range of costs by their services, it presents as many problems as it modifies. A broad range of individual children's service dates in a sparse record would be as likely to mask periods of ineligibility within it as it would be to mark long healthy periods.

A second attempt to detect ineligibility was not helpful either. The Nine State Survey questions on possible loss of eligibility as one cause for not reaching treatment were answered unevenly.

Despite these data limitations, stronger support for excluding estimates of eligibility emerged from calculating an average cost per child, based on the state range alone. There is a built-in, but unspecified, eligibility factor. This figure represents actual Medicaid dollars spent for an average child over a fixed period of time with gaps of eligibility built in and averaged out across children. While these averages would be distorted for an individual child by not knowing their unique eligibility, the average cost for the cohort would be

Table 2.6

FREQUENCY DISTRIBUTION OF STATE SERVICE INFORMATION BEFORE AND AFTER SCREENING: NUMBER OF CHILDREN WITH 3-12 MONTHS OF COST DATA.

	Months of State Range BEFORE													Months of State Range AFTER												
	12	11	10	9	8	7	6	5	4	3	2	1	SCREEN	1	2	3	4	5	6	7	8	9	10	11	12	
Texas	186	44	51	50	1		1	1	2	3			S									24	53	99	162	Texas
Michigan	1		60	100	82	174	1						C					1		4	21	61	109	129	97	Michigan
Iowa	274	1	1	1			1	4					R						19	69	64	67	62	1		Iowa
Contra Costa			12	16	15	15	5		1	1			E									16	17	16	16	Contra Costa
California													E			2	1			1	64	78	54	62		California
Tennessee													N							4	39	46	65	80	114	Tennessee
	12	11	10	9	8	7	6	5	4	3	2	1	SCREEN	1	2	3	4	5	6	7	8	9	10	11	12	

Before Screening: 99.0% of the children had 6-12 months of Cost Data

After Screening: 99.8% of the children had 6-12 months of Cost Data accurate across the time period and would reflect their average span of elibigility. This gives a figure most useful to state planners, since the only costs to be paid, under the current program, are those to elibible children.

3. Data Limitations by "Problems". The cost data was limited by the number of problems whose costs were accessible from state-to-state, as well as by their individual time ranges (see Table 2.7). Several states had gaps in accessible cost information for particular problems. Each missing condition withdraws that state from comparison with other states for that problem and moves its comparison to the next more general or specific level of analysis. For example, since Texas included no dental costs, their total cost comparisons must be with other states' medical costs alone, a more specific comparison that total medical and dental costs. On the other hand, since Michigan included no ICDA codes to track specific problems, only the easily accessible dental, vision, and immunization costs were clear-cut enough to be tracked, leaving the balance of Michigan's costs comparable to other states only on a more general level.

Specific problem cost information was not accessible from the following states (see Table 2.7).

a. Dental: No costs from Texas.

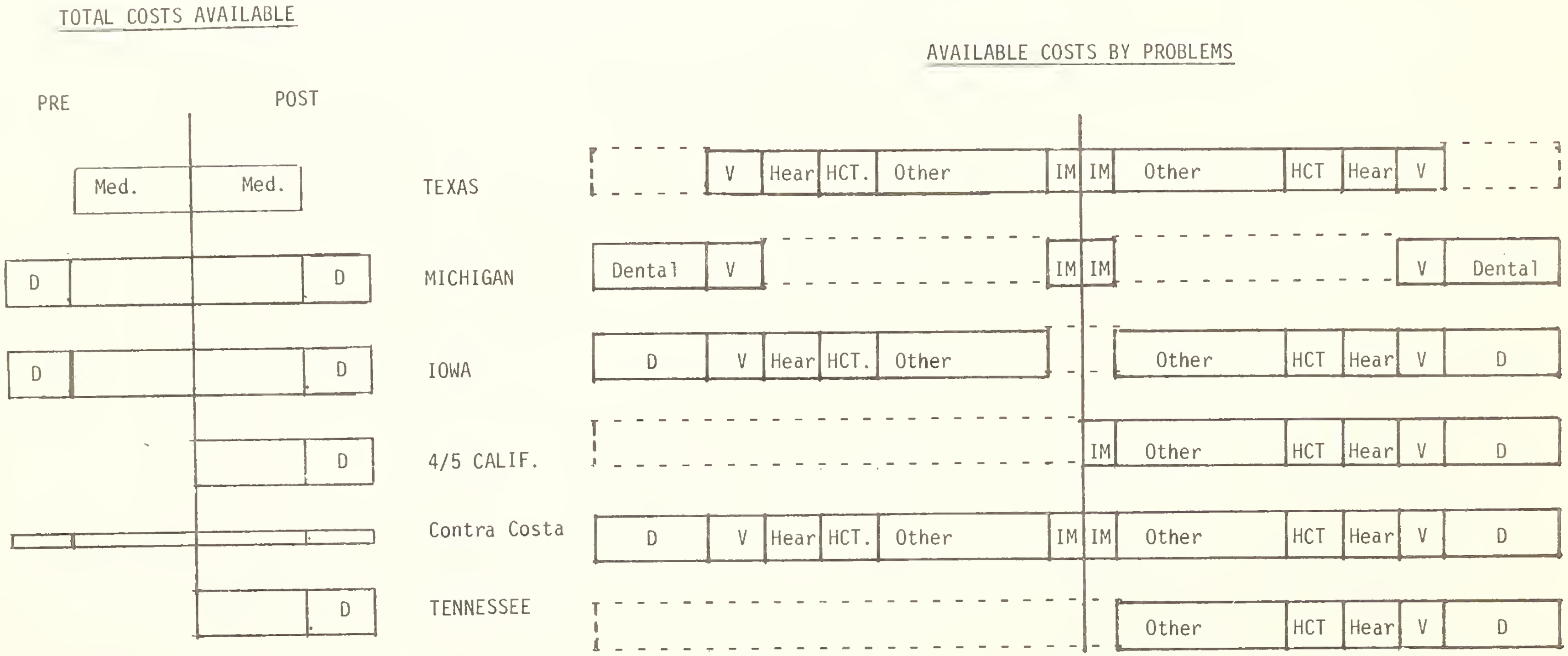
b. Specific ICDA Designated Conditions (called problems Other 1-4 in the study): Michigan.

c. Immunization: Iowa and Tennessee.

4. Limitations of Defining and Tracking a Problem. Finding an accurate point of contact between screening problems reported by the Nine State Survey and their related cost data underlines a final area of data limitations, defining and tracking these problems.

The original Nine States sample was drawn from children with problems found at screening. Any problem, up to four, other than the routinely reported

Table 2.7



Dental
Vision
Hearing
Hematocrit
Other Problems (1-4:ICDA Diagnoses)
Immunization

dental, vision, hearing, hematocrit, or immunization problems were described verbally and later fit with an ICDA code. As appropriate for an initial screening clinic, the description of these problems ranged widely in precision from general symptoms, such as "sore throat" or "fever", to specific diagnoses such as tonsillitis or bronchitis. To match diagnostic and treatment costs effectively with their screening problems, the most useful original description of a problem was in the terms of a moderately specific diagnosis. Descriptions that were too precise or too vague added difficulty to tracking.

If the problem description was too precise, it left little room for differing diagnostic opinions. For example, when a child would be treated in a physician's office, a hospital emergency room, and as an inpatient within a few days of each other, with three partially overlapping diagnoses, the costs for even a finely diagnosed condition could be combined appropriately despite several ICDA codes. However, the greater the distance in time from the screen and the farther apart the treatments with neighboring diagnoses, the greater the uncertainty in assigning costs to these problems. On the other extreme, problems with vague initial symptoms at the screen usually condense into a more precise diagnostic condition. Over time, the question arises whether to include later costs that fall within the original broad symptom range as costs allied to the initial problem or whether these new costs represent new conditions with similar general symptoms.

In general, this study has considered a problem detected at screening as a "problem area" and has included costs within that area, whether broadly or narrowly defined, as related to that problem. However, if a problem was defined as broadly as "fever", for example, and if there were any indications of the number of days to treatment from the Nine State Survey, the diagnosis given in the cost data on that treatment date, if similar to the original symptoms, was used as a criteria for selecting costs.

Individual State Data Characteristics.

1. Texas. Despite the lack of dental cost data, the Texas data offered an otherwise excellent base, describing the ICDA code and medical procedures both in code and in English. The basic cost record began with claims paid by July 1, 1975. For some children, the addition of separate fiscal year 74-75 data extended their range of service to January 1, 1975.

2. Michigan. The Michigan data was received with only a state recipient number for identification. Unlike most other states, there was no name, age, or sex for confirmation.

3. Iowa. Iowa organized the costs by batch under a single diagnosis. Any secondary problem or other treatments on those dates of service would be added to that single diagnosis. The procedure code manual was not available to distinguish treatments within these batches. Iowa included costs at screening. Without a code manual, the costs could not be accurately assigned to basic screening, follow-up tests, or on-site treatment. A procedure code, common to all children, was selected as the screen cost and the balance of the costs were added to the post-screen total.

4. Contra Costa, California. Since the cost data from Contra Costa County was in a different format from the rest of California and covered a different time period, it is treated as a separate state. Because dental cost information came from a separate source than the medical costs, there may be the possibility of some incomplete records.

5. California (except for Contra Costa). Like Contra Costa, the separate source of dental information created the possibility of some incomplete records. The California data recorded all billed services, paid or not, recording which

claims were refused or returned to the provider, or, in some cases, such as scoliosis, paid by other sources. There were some claims not paid in 12% of the California records. Nine children's data were missing the final page, so their state ranges after screening were set equal to their last service. Six records lacked the first page. If the first service on the second page was on the screening date or earlier, the record was used for post-screening costs; if not, it was considered incomplete. The Los Angeles site was the only one in the five states to include an itemized screen cost sheet, so their screen costs are complete.

6. Tennessee. Tennessee, like Iowa, both expressed their medical procedures only in code and included screen costs. The standard screening costs was subtracted out and the remainder added to the post-screen costs.

Coding the Cost Data.

1. Matching Nine State Survey Child with Medicaid Data.

Careful identification of each case was made using all the available data, including name, age, date of birth, Medicaid or state recipient number, and sex, when possible in order to compare treatment status and other data found by local workers with the cost results.

2. Eligibility Status.

Any loss of eligibility was recorded from information on the *Nine State Survey* code sheets, although these questions were addressed unevenly across states and sites by the original coders. If a child had only costs before the year prior to screening, this was noted to support continuous eligibility.

3. Age at Screen.

For children under two years old, their age was calculated in months. For the balance of children, 2-21 years old, their age was computed in years.

4. Range of Cost Data.

Two pairs of ranges were calculated for each child, a state service range reflecting the span of cost information before and after the screen and an individual claim range for each child, bounded by the earliest claim before the screen and the latest claim afterwards. For each range, the number of days between the screen and the end points was calculated, divided by 30.4 and increased by one, giving the number of months inspected. A maximum of twelve months before the screen and twelve months after the screen was used to preserve the age baseline of the analysis. The calculation of state service end points was discussed above as was the decision to rely on the state ranges alone. If the first state service date before the screen was earlier than the child's date of birth, the latter was substituted and the state range calculated from that date. For example, if a child from Iowa was born on July 1, 1975 and screened on February 1, 1976, the state range of service before screening for that child would be calculated as the eight months since birth, rather than as the twelve months from the earliest state service date within a year of the screen. It would be inaccurate to consider this child's cost as representing twelve months of possible service for which there might be medicaid costs when it had not been born for four of those months.

5. Cost of Screen.

For Iowa, Tennessee, and Los Angeles, subject to the data limitations described above, the cost of the screen was reported. The basic cost was separated out and not included in the total amount paid before or after the screen.

6. Total Cost Before and After Screen.

A simple sum was computed of all Medicaid costs paid for services between the state service range date before the screen and the screen and between the screen and the final state service date. Iowa and California supplied the amount of the original bill which was reported as a separate figure for these two states.

7. Pharmacy Costs Before and After Screen.

All available pharmacy costs were included from inpatient, emergency room, and outpatient sources. Medications given by physicians in their office were not included.

8. Total Number of Hospital Days Before and After the Screen.

9. Total Costs of Screen-Related Problems Before and After Screen.

If a problem was identified at screening and reported as a problem on the Nine State Survey, it is termed a screen-related problem and costs were tracked for that problem before and after the screen within the limits of the state service range. The format included room for possible dental, vision, hearing, hematocrit, and immunization problems and up to four other problems identified by ICDA code. No child had more than four recorded other problems. Three children had four problems, two in Michigan where individual other problem costs could not be tracked. The third child was hand analyzed in problem frequency counts, since the Nine State Survey assigned ICDA codes to the first three other problems only. The medical procedure codes and descriptions and the ICDA codes in the state data were used to link screen-related problems to their costs. There were no coder disagreements over medical questions, but, should they have appeared, they would have been resolved by an intern or resident from The University of Texas Health Science Center. Table 2.8 describes the ICDA code groupings used.

10. Total Costs for Selected Non-Screen-Related Problems Before and After.

Dental, vision, and immunization cost information was collected for all children when available. When no problems were detected in these areas at the screen for a particular child, the problems were termed non-screen-related problems and any associated costs were collected and recorded separately from screen-related-problems. For every child, each of these three problems, therefore, was either screen-related or non-screen-related.

Table 2.8

ICDA CODE RANGE

		Code Range
I.	Infective Diseases	001-136
II.	Cancer	140-209
III.	Benign and Unspecified Neoplasms	210-239
IV.	Nutritional Deficiencies	240-279
V.	Blood Diseases	280-289
VI.	Mental Disorders	290-315
VII.	Nervous System	320-358
VIII.	Vision	360-379
IX.	Hearing	380-389
X.	Heart	390-458
XI.	Respiratory System	460-462, 464-499, 501-519
XII.	Digestive System	520-577
XIII.	Genitourinary System	580-629
XIV.	Pregnancy - Birth Problem	630-679
		760-779
XV.	Skin	680-709
XVI.	Musculoskeletal System	710-738
XVII.	Birth Defects	740-759
XVIII.	Other	780-999
XIX.	Tonsils and Adenoids	463 and 500

11. Number of Visits per Problem.

The number of visits was defined as the number of outpatient visits added to the number of hospital days and was recorded for each problem whose costs were tracked.

12. Type of Problem.

The total costs before and after screening were assessed for each screen-related problem. Five patterns were identified:

Type 1: Children whose screen-detected problem generated no costs before the screen and some costs after the screen.

Type 2: Children whose screen-detected problem generated no costs before the screen or after the screen.

Type 3: Children who revealed costs for a problem before the screen, whose problem needed treatment when it was recorded at screening, but for which no post-screening costs were reported.

Type 4: Children whose screen-related problem generated costs both before and after screening.

Type 5: A fifth type of problem was added to identify those rare problems whose costs could not be tracked. For example, a few problems had no verbal description and were given an ICDA code of 796, "other".

These patterns of cost for a particular problem will use a shorthand diagram (included on the code sheet) throughout the study and tables.

	Costs Before Screen	Screen	Costs After Screen
Type 1		Problem--	--------$
Type 2		Problem	
Type 3	$-------------	--Problem	
Type 4	$-------------	--Problem--	--------$

These types will not be appropriate for states with no cost data before screening, since problems in these states will show only costs or no costs after screening.

13. Problems Costing $500 +.

Previous data from Contra Costa, California suggested that conditions costing in excess of $500 fell approximately 1.5 standard deviations above the mean. Therefore, conditions with total costs greater than $500 were flagged and hand analyzed to show total costs, hospitalization costs and out-patient costs. Common problems were grouped and unique ones reported individually.

14. Comparison of Nine State Survey with Five State Cost Analysis Data.

Each screen-related problem was examined to compare the information on treatment within four months of screening between the Nine State Survey and the five states's cost data. Agreement between the two and disagreements in either direction were recorded. When the costs of screen-related problems were compared for children who showed versus those who did not show, a combined definition of "show" was used. If the Nine State reviewers had indicated no show for treatment, but relevent costs later appeared in the data, this was considered as a show.

Annualized Costs.

For states with cost data before screening, annual costs were computed by dividing the child's total costs up to a year before screening by the number of months inspected during this period and multiplying by twelve.

Annualized costs after the screen, however, were computed to preserve the impact of costs related to problmes found at screening. These screen-related problems have been identified and tracked and tend to generate the greater part of their cost within several months of the screen. Their real costs were computed and added intact to the annualized balance of their cost according to the following formula:

$$\begin{array}{l}\text{Screen}\\ \text{Related} +\\ \text{Costs}\end{array} \left[\left(\frac{\text{Total Costs after Screen} - \text{Screen Related Costs}}{\text{Number of Months of State Data Inspected}} \right) \times 12 \right]$$

For example, if a child had a total of $175 in Medicaid costs ($75 screen related and $100 in other costs) reported for ten months of available state data after screening, the annualized costs would be the $75 in screen-related costs added to the monthly average for the other non-screen related costs during the reported time: $\left(\frac{\$100\text{ (other)}}{10\text{ (months)}} = \$10\text{/month} \times 12\text{ months} = \$120\text{ for annualized costs}\right)$ or $75 (screen-related costs) + $120 (annualized other costs) = $195 (total annualized costs after screening).

Texas has no dental cost data and could not appear in comparisons using total annualized costs. A separate annualized medical cost was computed for all states to allow Texas to be included. The same formulas were used after all screen-related and non-screen-related dental costs had been subtracted.
The difference between the annualized costs before screening and after screening was calculated for both the total costs and the medical costs alone. This figure expressed the change in Medicaid cost.

Recommendations For Future Medicaid Cost Analyses

Problem Area Versus Specific Problem. Tracking costs for screen-related problems presents two initial choices. The first is to work on the level of cost areas, such as diagnostic groupings, that include all the costs over a specified time period within each problem area. The second approach is to track specific conditions for children from their discovery through their treatment. For the first choice, a computer can be used to select costs by ICDA diagnosis. For the second alternative, however, a field staff is needed to be in contact with the screeners, providers, and children. Several issues must be addressed in either of these alternatives, most of which bear more directly on a child/individual condition orientation.

Diagnostic Inclusiveness - Two philosophies in defining a screen-related problem were noted in practice. Some screeners recorded only those problems that had been undiagnosed previously, while others noted any current problems whether or not it had been diagnosed or was in treatment at screening. Within a study's screening sites a common definition must be used.

There was a great variety of specificity in describing problems, in part apparently because many problems could only be described by early symptoms such as fever or pain in the side, while others carried clear cut diagnostic descriptions such as tonsillitis. Any cost tracking procedure must take into account the possible lag between a symptom described at screening early in a disease process and its later diagnosis. Individual follow-up for each child's problem would be needed until a more specific diagnosis could be established that would then be set as a criteria for tracking its costs. Many screen-related problems may be symptoms too vague and as yet undefined to track accurately. If any consideration is given to problem resolution, separate physical examinations must be given as a post measure, since a show for treatment may not assume compliance with treatment or problem resolution.

Cost Data Completeness - State cost data can often mask multiple problems and treatments by listing only a primary diagnosis. Several problems being evaluated under one office visit often receive only a single primary diagnosis. Either data formats are needed to include multiple problems, or individual problem tracking must be done among community providers.

CHAPTER 3

Impact of EPSDT Referrals on Overall Medicaid Cost for Children Under 21

Each child's Medicaid profile was reviewed by hand to compute the total dollars paid during the time available before as well as after screening, as well as the costs that were specifically related to the problems found in screening. The result of looking at this data, after certain corrections, was that the average monthly Medicaid cost increased about $3 per month per child over the entire sample, and that the net new Medicaid costs attributable to EPSDT is approximately 20% of the total Medicaid costs that occur after screening. The major problem in looking at total Medicaid cost data without looking at this screen-related component is that high cost problems occur randomly before and after screening, and will dominate the total Medicaid cost picture. These findings are discussed in greater detail below, and are presented to give a broad perspective on the sample before presenting the major findings in Chapter 5.

The total dollars that were paid according to the Medicaid profiles are shown in Table 3.1 for the 1,713 children in the study. Also shown are the average months of data available between the first date of service available in the data set, and the child's date of screen. When this number of months is assumed to be true for all children in each state, the dollars per month per child is calculated by dividing the dollars paid by the months and then multiplying by the number of children. The range between states was $6 to $15 per month per child before screening,with an overall average of $13 per month. Applying the same procedure showed a range of $14-$19 between states after screening, with an overall average of $16. However, as shown later, the

TABLE 3.1

Total Treatment $ Paid by Medicaid in Behalf of Children in the 5 State Sample Having at Least one Problem (January 1975 to January 1977) for the Indicated Months of Data Available

State	# of Children	Average # months Available Before Screening	$ Paid Before Screening	($/mo.) Per Child	Average months of data Available After Screening	$ Paid After Screening	($/mo.) Per Child
Texas (no dental)	338	11.0	47,156	13	11.2	52,635	14
Tennessee	348	3.1	6,263	6	10.5	55,000	15
Michigan	418	8.1	42,334	13	10.5	78,177	18
Iowa	282	11.9	49,221	15	8.3	42,699	18
Contra Costa	65	8.1	6,567	13	10.5	12,819	19
California (without Contra Costa)	262	2.5	8,579	13	9.4	35,591	15
			160,120			276,921	

variability between children is so high that this $3 per month difference may not be statistically meaningful although it does represent the net change that occurred in this data set between the two years. Hospitalizations accounted for 54% of the total costs prior to screening, and 37% of the costs after screening.

The screen related cost (i.e. costs attributable to the problem referred from screening) was computed for each child, and this cost, in the current total sample, comprised 17% of the total Medicaid costs paid before screening, and 40% of the total Medicaid costs paid after screening. This is a maximum percent because we used a fairly broad interpretation of treatment costs that were related to the screen. Table 3.2 shows the data about screen related findings.

The net result (.4 - .17) shows that slightly over 20% of the costs incurred after screening are newly generated due to the EPSDT screen itself. More details of the screen related costs are given in Chapter 5, but this chapter continues with a more detailed discussion of the total Medicaid cost and their changes. Table 3.3 shows the annualized costs after screening for various states and age groups. As can be seen in the table, the standard deviations are quite high so that a 95% confidence interval on any one mean for the various breakdowns would include the mean plus or minus $30-$40. In the first two columns of dollar figures of Table 3.3, it is interesting to note that the urban sites had statistically greater costs per child both before and after screening.

Table 3.4 presents similar data, but includes both medical and dental costs.

Since the variability is so high, multiple regression was used to isolate the independent effects of the variables available in the data. These regressions

TABLE 3.2

Comparison of Total Dollars Paid and Screen Related Costs for Medicaid Treatment of Children Screened and Having Problems (January 1975 - January 1977)

State	# of Children	Total Medicaid $ Paid Before Screening in Available Data	Dollars Paid Before Screening For Problems Found in Screening	Ratio of Screen Related to Total	Total Medicaid $ Paid After Screening	Dollars Paid After Screening for Problems Found in Screening	Ratio of Screen Related to Total
Texas	338	$47,156	$ 7,748	.164	$52,635	$17,931	.341
Tennessee	348	6,263	650	.104	55,000	24,460	.445
Michigan	418	42,334	5,392	.127	78,177	32,428	.415
Iowa	282	49,221	11,746	.237	42,699	15,778	.369
Contra Costa County	65	6,567	261	.039	12,819	5,812	.453
California (without Contra Costa)	262	8,579	1,970	.230	35,591	14,046	.395
Totals	1,713	$160,120	$27,767	.17	$276,921	$110,455	.40

TABLE 3.3

Mean and Standard Deviation of Medical Medicaid Annualized* Treatment Costs per Child Before and After Screening (Aggregated only when Allowed by the Data Available) by State, Age Group, Rural versus Urban, and Problem Count

	TOTAL MEDICAL ANNUALIZED COST PER CHILD							TOTAL SCREEN RELATED COST PER CHILD				
	Total Medical Annualized* Cost After Screening			Annualized Total Medical Cost Before Screen**			Total Medical Cost Change $ per Child	Screen Related Costs After Screening			Screen Related Costs Before Screening	Change in Screen Related Costs
	N	$ per child	S.D.	N	$ per child	S.D.		N	$ per child	S.D.		
By State												
Texas	338	$163	($319)	338	$146	($726)	$17	338	$ 53	($152)	$23 ($248)	$ 30
Tennessee	348	$118	($275)									
Michigan	418	$162	($369)	418	$135	($506)	$27	418	$ 44	($ 71)	$10 ($ 36)	$ 24
Iowa	282	$174	($389)	282	$198	($766)	$-24	282	$ 42	($148)	$36 ($190)	$ 6
Contra Costa	65	$180	($372)									
California without Contra Costa	262	$146	($492)									
By Age Group**												
0-4	481	$159	($350)	281	$269	($1102)	$-110	281	$ 30	($ 87)	$42 ($298)	$-12
5-9	318	$169	($360)	318	$ 73	($182)	$ 96	318	$ 46	($108)	$ 7 ($ 29)	$ 39
10-12	174	$133	($286)	174	$101	($455)	$ 32	174	$ 49	($112)	$ 6 ($ 28)	$ 43
13-21	265	$191	($409)	265	$171	($467)	$ 20	265	$ 63	($173)	$28 ($150)	$ 35
Rural vs Urban**												
Rural	348	$121	($253)	348	$133	($694)	$-12	348	$ 35	($ 86)	$27 ($246)	$ 8
Urban	690	$188	($400)	690	$167	($640)	$ 21	690	$ 52	($140)	$19 ($123)	$ 33
Problem Count												
0**	377	$144	($357)	377	$139	($531)	$ 5	377	$ 31	($ 64)	$10 ($ 37)	$ 21
1	523	$155	($309)	523	$151	($741)	$ 4	523	$ 50	($137)	$28 ($233)	$ 22
2	116	$272	($532)	116	$223	($688)	$ 49	116	$ 80	($196)	$22 ($133)	$ 58
3	18	$215	($278)	18	$164	($278)	$ 51	18	$ 46	($ 44)	$65 ($154)	$-19
≤4	4	$207	($100)	4	$173	($45)	$ 34	4	$174	($ 65)	$74 ($ 20)	$100

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*Annualization was accomplished by adding the screen-related cost to the annualized remainder.

**For Texas, Michigan and Iowa only because they are the states with the most complete before and after data.

TABLE 3.4

Mean and Standard Deviation of Medical and Dental Medicaid Annualized* Treatment Costs Per Child Before and After Screening (Aggregated only when Allowed by the Data Available by State, Age Group, Rural versus Urban, and Problem Count

	Iowa and Michigan Annualized Total Medical and Dental Costs						Iowa and Michigan Medical and Dental Screen Related Costs					
	Total Annualized Dollars After Screening			Total Annualized Dollars Before Screening		Change	Screen Related Dollars After Screen			Screen Related Dollars Before Screen		Char
	N	$ per child	S.D.*	$ per Child	S.D.		N	$ per child	S.D.	$ per Child	S.D.	
State												
Michigan	418	$162	($369)	$135	($506)	$27	418	$ 78	($103)	$13	($ 40)	$65
Iowa	282	$174	($389)	$198	($766)	$-24	282	$ 56	($152)	$42	($191)	$14
Age Group												
0-4	206	$164	($374)	$269	($993)	$-105	206	$ 33	($ 67)	$36	($178)	$-3
5-9	228	$167	($370)	$ 75	($196)	$ 92	228	$ 76	($124)	$12	($ 38)	$64
10-12	110	$ 97	($184)	$ 67	($222)	$ 30	110	$ 70	($101)	$12	($ 40)	$58
13-21	156	$219	($476)	$206	($571)	$ 13	156	$106	($178)	$36	($159)	$70
Rural vs Urban												
Rural	212	$125	($275)	$117	($481)	$ 8	212	$ 65	($ 89)	$18	($102)	$47
Urban	488	$185	($413)	$178	($676)	$ 7	488	$ 70	($138)	$27	($135)	$43
Total Problem Count												
1	248	$159	($317)	$169	($752)	$-10	411	$ 65	($109)	$32	($177)	$33
2	59	$343	($646)	$263	($652)	$ 80	113	$ 99	($126)	$43	($186)	$56
3	13	$141	($ 80)	$110	($259)	$ 31	34	$135	($309)	$81	($171)	$54
≥4	3	$347	($ 40)	$199	($ 30)	$148	10	$131	($ 82)	$95	($ 20)	$36

*S.D. = Standard Deviation

are summarized in Table 3.5, and show that the most important factor affecting the change in Medicaid dollars paid (after screening minus before screening) is the total costs generated by that individual prior to screening. The dependent variable in the regressions were "change in annualized total cost" and "change in annualized medical cost." .The regression coefficients show for the cost before screening, a one dollar higher cost before screening, meant a one dollar less positive change in cost after screening. The variables coded as ("0" or "1") indicate the positive change that occurs, on the average, when that variable is in effect.

Since the total annualized cost before screening were important, Table 3.6 was prepared to show the influence of the previous payments. It can be seen that when costs were high before, they tended to be lower after screening. Some have called this "regression toward the mean" and is always a problem in change analysis. What it means is that high cost episodes of hospitalization occur randomly, and that those who were high before screening will be low after screening, and those low before screening will become high after screening. Tables 3.7 and 3.8 break the total changes into greater detail by age group and the total costs that the child had prior to screening. Those children with no costs prior to screening incurred $70 to $100 during the year after the screening, and therefore had less variation in costs between age groups than those children who were already utilizing the Medicaid system prior to children.

There is now considerable interest in the delivery of primary care services and the amount of Medicaid costs for children who go for primary care. The costs of the primary care services were estimated by subtracting the cost of hospitalization from the total Medicaid costs for these children who were present in Table 3.2. The data on hospitalizations is in Table 3.9 and shows that 80 children in

Table 3.5

Regressions of Change in Annualized Costs

(Dollars After Screen Minus Dollars Before Screen)

(Considered variables of sex, periodicity, rural vs urban, needs immunization, age group, annualized costs before screening, problem count.)

Dependent Variable: Average ± (95% Confidence Interval)	Change in Annualized Total Cost per Child ($25 ± 51)	Change in Annualized Medical Cost per Child ($11 ± 41)
Selection Criteria	Michigan, Iowa at least three months of data before and after screen.	Michigan, Iowa, Texas, Contra Costa at least three months of data before and after.
Sample Size	700	1,103
R^2	.71	.74
F calc	424.46	1,032.16
degrees of freedom	4,695	3,1099
Constant (intercept)	147.10	148.36
Independent Variable	Regression Coefficient (Standard Error) [Average]	
Total Costs Before Screening	-.93 (.02) [173.85]	-.93 (.02) [164.21]
Age group 13-21 (1=this age) (0= other age)	87.83 (34.47) [.22]	
Number of problems per child with problems	(Medical + Dental) 32.58 (17.34) [1.12]	(Medical only) 40.49 (14.2) [.82]
Rural location (1= rural) (0= urban)	-51.98 (31.24) [.30]	-58.12 (23.16) [.32]

Table 3.6

Comparison of Change in Annualized Costs (After Screening minus Before Screening) for Children With Problems in Screening in Texas, Michigan, Iowa, Contra Costa by the Level of Previous Medicaid Costs

Annualized Medical Cost Before Screening		Number Children	Proportion of Total Children	Average Dollar Change	Standard Deviation	95% Conf. Inter.	Total Dollar Change
(0)	None	402	.37	$96	246	(± 24)	$38643
(1)	$1-49	300	.28	142	384	(± 44)	42498
(2)	$50-99	163	.15	115	332	(± 50)	18702
(3)	$100-199	110	.10	113	413	(± 77)	12423
(4)	$200-499	41	.04	-62	306	(± 94)	-2526
(5)	$500-999	37	.03	-460	384	(±123)	-17024
(6)	> $1,000	36	.03	-2266	2467	(± 806)	-81568

Table 3.7

Change in Annualized Medical Costs (Cost After minus Cost Before Screening) for Children With Problems by the Level of Previous Cost and Age

Annualized Dollar Costs Before Screening		Change in Cost by Age Group 0 - 4	5-9	10-12	13-21
None	Mean=	$80	$86	$68	$98
	SD=	(142)	(210)	(118)	(150)
	N =	[89]	[127]	[88]	[98]
1-49		$90	$197	$141	$122
		(221)	(491)	(354)	(367)
		[75]	[99]	[43]	[83]
50-99		$152	$135	$86	$36
		(394)	(357)	(218)	(204)
		[60]	[48]	[23]	[32]
100-199		$89	$98	$53	$183
		(408)	(391)	(361)	(469)
		[44]	[31]	[7]	[28]
200-499		$-7	$-88	$-65	$-100
		(416)	(299)	(228)	(211)
		[13]	[11]	[7]	[10]
500-999		$-597	$-224	$-423	$-526
		(127)	(565)	(388)	(326)
		[7]	[8]	[5]	[17]
> 1,000		$-3071	$-1345	$-1832	$-1357
		(3124)	(155)	(921)	(1434)
		[18]	[3]	[4]	[11]

Table 3.8

Average Change in Total Annualized Costs (Medical and Dental) for Children With Problems (Costs After minus Cost Before Screening)

Annualized Cost Before Screening		AGE			
		0 - 4	5 - 9	10 - 12	13 - 21
None	Mean=	$78	$112	$104	$238
	SD=	(129)	(229)	(122)	(552)
	N =	[59]	[84]	[53]	[53]
$1-49		$106	$128	$134	$197
		(236)	(321)	(281)	(454)
		[50]	[55]	[23]	[36]
$50-99		$152	$326	$76	$83
		(336)	(581)	(194)	(200)
		[36]	[33]	[16]	[18]
$100-199		$155	$106	$-23	$212
		(464)	(402)	(74)	(508)
		[30]	[29]	[8]	[20]
$200-499		$-107	$-45	$36	$-85
		(235)	(243)	(250)	(219)
		[9]	[14]	[3]	[8]
$500-999		$-631	$-147	$-209	$-499
		(116)	(583)	(335)	(149)
		[7]	[6]	[4]	[9]
$ > 1,000		$-3007	$-1360	$1465	$-1310
		(2793)	(125)	(44)	(1524)
		[12]	[3]	[2]	[10]

the sample had an average of 1.4 hospitalizations prior to screening that averaged 5.2 days per hospitalization. The cost of each hospitalization averaged $795. In the total sample (both before and after screening) there were 204 children with 265 hospitalizations. The data from Table 3.2 can be compared to Table 3.9 with the following results:

	Before Screening	After Screening
Total Costs without Texas	112,964	224,286
Hospital Costs (without Texas)	53,441	72,446
Dental	4,922	42,004
Total - Hospital - Dental = Ambulatory Medical Care Costs	54,601	109,836
% of total costs that were Ambulatory Medical	48%	49%
% of total costs that were Dental	5%	19%
% of total costs that were Hospitalization	47%	32%
% of total costs that were Non-Hospital	53%	68%

The costs for Texas were excluded from the above summary because the Texas costs did not include the dental component. However, the proportion of the total medical costs that were for hospitalization was the same as in the other states. In the summary table shown above, it can be seen that the proportion of total costs that were hospitalization oriented declined in the time period after screening

TABLE 3.9

COST ANALYSIS; HOSPITALIZATIONS

	Total Hosp. Dollars	Total Numb. Hosp.	Total Numb. Days	Total Numb. Kids	Total Hosp. Dollars	Total Numb. Hosp.	Total Numb. Days	Total Numb. Kids	Mean Cost Per Hosp.		Mean Cost Per Child		Mean # Hosp. Per Child		Mean # Days Per Hosp.		Mean # Days Per Child		Dollars Per Day
									Before	After	Before	After	Before	After	Before	After	Before	After	
Texas	$ 32,466	38	189	32	$ 30,427	54	212	45	$854.37	563.46	1,014.56	676.16	1.2	1.2	5.0	3.9	5.9	4.7	156.84
Tennessee	-	-	-	-	13,483	30	95	24	-	449.43	-	561.79	-	1.3	-	3.2	-	4.0	141.93
Michigan	21,785	25	121	17	21,149	29	91	25	871.40	729.27	1,281.47	845.96	1.5	1.2	4.8	3.1	7.1	3.6	202.51
Iowa	27,227	36	220	24	17,821	28	122	23	756.31	636.46	1,134.46	774.83	1.5	1.2	6.1	4.4	9.2	5.3	131.71
California	-	-	-	-	13,838	11	66	10	-	1258.00	-	1383.80	-	1.1	-	6.0	-	6.6	209.67
Contra Costa	4,429	9	27	7	6,155	5	12	3	492.11	1231.00	632.71	2051.67	1.3	1.7	3	2.4	3.9	4.0	271.38
Total	$ 85,907	108	557	80	$102,873	157	598	130	$795.44	655.24	1,073.84	791.33	1.4	1.2	5.2	3.8	7.0	4.6	163.46
Total Before + After	$188,780	265	1155	204					712.38		925.39		1.3		4.4		5.7		
States with Before and After	Total Before and After										Total Before and After								
Texas	62,893	92	401	76					683.62		827.54		1.2		4.4		5.3		
Michigan	42,934	54	212	40					795.07		1,073.35		1.4		3.9		5.3		
Iowa	45,048	64	342	44					703.88		1,023.82		1.5		5.3		7.8		
Contra Costa	10,584	14	39	10					756.00		1,058.40		1.4		2.8		3.9		
Total	161,459	224	994	170					720.80		949.76		1.3		4.3		5.8		

and the proportion that were dental increased substantially. If the dental costs were considered to be a valuable service on their own merit, then the medical costs being incurred could be said to be considerably reduced after EPSDT screening and problem identification because there was a reduction in the proportion of the costs going to hospitalization. In Texas the hospitalization costs declined from 68% to 57% of the total. However, due to the treatment of newly found problems, there was still a small, but not statistically significant increase in the costs. It is unfortunate that we did not have available the costs of those children with no positive findings as well as those with no screens for a comparison. Perhaps the children who had been in the hospital were more likely to get screened, and therefore show a cost reduction. However, previous studies by our Institute have shown in Contra Costa County California, and Texas, that those persons not screened had higher costs prior to screening due to some hospitalization. Therefore it is possible that EPSDT can have an influence in shifting the mix of dollars spent to provide more ambulatory and dental care for very few additional treatment dollars. There are several qualifications that must be made in presenting this hypothesis. First, we are only dealing with treatment costs. EPSDT generates additional costs for outreach and health education to recruit the eligible children to be screened and for the screening itself which are not included in this study. The second qualification is that 70% of the conditions for which hospitalizations occur may be independent of the efforts of the majority of the current EPSDT programs, and, therefore, EPSDT may not be the causal agent in reducing most of the hospitalization costs.

Due to this indication of high costs before and after screening having an undue impact on the total cost picture, the high cost children are discussed next as Chapter 4.

CHAPTER 4

Analysis of Children with High Cost Conditions in Their Medicaid File

The children with conditions costing more than $500 were reviewed. Conclusions are given first, then the the methodology of studying their files is presented.

Children under five had high expenditures (in order of total dollars) in pneumonia, bronchitis, and hernia and hydrocele, all of which required hospitalization (Table 4.1).

Children age five to twelve had their largest expenditures (by order of total dollars) in tonsillitis, mental and emotional, and heart, with the tonsillitis and heart generating hospitalization and mental-emotional primarily outpatient.

Children age twelve to twenty one had largest expenditures in (by order of total dollars) accidents and injuries, deliveries and vision.

A good preventive program which wants to reduce Medicaid costs must develop mechanisms for predicting persons likely to have the high cost type problems (which differ greatly by age group) in the 0-12 age group and designing specialized intervention. For children over age twelve, it is probably difficult to prevent the accidents and injuries. Family planning needs to be highly accessible for this age group as well. An absolute maximum of 30% of the high cost problems could have been generated by the screening program.

Problems Costing More Than $500

Five of the six states' data was complete enough to examine costly problems. Without ICDA codes to identify specific problems, Michigan was not included. Therefore, the data reported in the following paragraphs is based on 1,295 children with at least one problem. Previous Medicaid data from Contra Costa, California

TABLE 4.1

$500+ CONDITIONS: DIAGNOSTIC GROUPINGS

	Age Distribution			Number of Periodic Screens	When Discovered***			H O S P I T A L I Z A T I O N S					O U T - P A T I E N T		Average Cost of Screen Related Problems
	<5	5-12	12-21	in "B"**	Before	Screen	After	Number	Average Total Cost	Average Number of Hospitalizations	Average Number of Hospitalized Days	Average Hospital Cost	Average Number of Outpatient Visits	Average Outpatient Cost	
1) Dental	2	1	0	0	1	2	0	3	$ 635	.33	.33	$ 139	3.67	$ 496	$ 663
2) Otitis	1	1	1	1	3	0	0	3	$1,083	1.33	2.67	$ 997	4.67	$ 86	-
3) Colitis	4	0	0	0	4	0	0	4	$1,509	1.25	13.25	$1,484	1.50	$ 25	-
4) Heart	0	4	0	1	1	1	2	4	$ 793	1.00	5.75	$ 712	2.00	$ 81	$ 617
5) Vision	2	0	3	1	2	1	2	5	$1,053	1.00	4.80	$ 986	3.20	$ 67	$ 842
6) Mental & Emotional	0	5	2	1	3	3	1	7	$1,225	0.43	6.00	$ 556	21.29	$ 669	$1,543
7) Delivery	0	0	8	0*	6	0	2	8	$ 622	1.25	2.75	$ 606	0.50	$ 15	-
8) Genito-urinary	3	3*	1	0*	3	2	3	8	$ 690	1.00	3.50	$ 668	1.50	$ 22	$ 808
9) Accidents & injury	2	3	4	3	4	1	4	9	$1,373	1.11	7.89	$1,237	4.11	$ 147	$1,088
10) Hernia & Hydrocele	4	3	2	1	1	5	3	9	$ 960	1.22	4.00	$ 905	1.73	$ 55	$1,161
11) Tonsillitis	3	12	2	3*	8	4	5	17	$ 629	1.06	2.47	$ 593	2.23	$ 36	$ 674
12) Pneumonia, Bronchitis, etc.	14 14	4*	2	3	13	3	5	21	$1,326	1.38	8.90	$1,219	7.90	$ 107	$ 854

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*One unknown case.

**The number of screens that were periodic in this study that had initial $500+ costs before screening, i.e., these children had prior screening.

***The first mention of the condition: Before (Before Screening), Screen (as a Screen-Related Problem), After (first Costs after Screening).

suggested that conditions costing in excess of $500 fell beyond 1.5 standard deviations from the mean cost per child. This criterion was set before the cost data were hand analyzed as a guideline for selecting conditions for individual evaluation. Because each state included a different time range of cost data, the summary of these costly problems includes the number of months examined for each state. Tennessee and California, without data before the beginning of the screening period (January 1, 1976), were therefore considered across a shorter period of time. These variations in time frame make the within-state analysis the most meaningful, comparing the proportional numbers and costs of these expensive problems to the total state. Between states, the more useful information comes from examining the diagnostic groupings which highlight frequently appearing problems. The case by case data are of interest themselves in outlining the pattern of incidence, discovery, and costs for the 112 expensive problems in the 1,295 sample.

Any condition that accrued a total cost of $500 or more over the entire span of a state's cost information, before and after screening added together, joined this group. Each problem was analyzed individually and included the case number, state, and site of the condition, its most frequent description or diagnosis, and its total costs before and after screening. The hospital information described the frequency, total days, and costs of inpatient stays before and after the screen. The total number of visits and costs of out-patient care before and after screening included both office visits and out-patient hospital visits. The point of discovery for each problem within this study's framework marked whether its first costs were recorded before the screen, if its first mention was at screening, or if its first costs appeared afterwards. For those with pre-screening costs, any information was noted that indicated the child had been screened earlier. That is, if the present screen was periodic, it is mentioned beside the point of discovery.

Twelve groupings were made by common diagnosis. Several of the groupings had few problems, such as three dental problems and three cases of otitis media, while others were larger, 17 or 21. These two large groups, tonsils and pneumonia/ bronchitis were by far the most highly frequent costs. The next most frequent diagnosis, accidents/injuries and hernia/hydrocele each had nine problems. Not only were the respiratory conditions, pneumonia and bronchitis, the most frequent costly problems, but their avarage costs ($1,326) was over twice that of the other highly frequent problem,tonsillitis ($629). Respiratory office visits were almost 3 1/2 times more frequent than tonsils, and three times more expensive per child. Thirteen out of 21 (62%) respiratory problems first occurred before screening, and of these, only 3 (23%) had been screened before.

Two other diagnoses had higher average costs than respiratory; accidents and injuries ($1,373 across nine cases) and colitis ($1,509 for four children) though they appeared far less frequently. As expected, the initial costs for accidents was spread evenly before and after screening, all four colitis cases developed before the screen,which was an initial one,for each child.

Half of the twelve diagnoses groupings as well as half of the 98 grouped conditions carried average costs between $1,000 and $1,500, while one third of the diagnoses groups and 36% of the grouped conditions had averages between $600 and $700. There appeared to be this separate group of very expensive problems ($1,000-$1,500) that included colitis, vision, mental and emotional problems, accidents, and respiratory problems. With the exception of accidents, few children with any expensive problem had been previously screened. Accidents and otitis media had the highest proportion of children with prior screens (1/3), but this was only one of the three otitis cases. For conditions that had their first costs before screening, only between zero and 14% of the children had been screened previously.

Most of these high costs were generated by hospitalizations. Every condition except two had an average of just over one hospitalization per child and relatively few office visits (1-8 per condition). One of the three dental problems required hospitalization. The pattern of spending was reversed in mental and emotional problems where there were only 0.43 average inpatient stays per child, but over 21 outpatient visits.

Children under five years old had two-thirds of the $500 + respiratory conditions, and 80% of the tonsils were in children between 5-12. All four of the children with colitis were under five years of age. Over 70% of the children with mental and emotional diagnoses were between 5-12 years old. The problems were poorly specified as "neurosis", "mental disorders," and included some psychosomatic disorders and mental retardation as well.

Table 4.2 presents the contribution that these children with high costs make to their state's Medicaid costs. One hundred and twelve children had 128 problems costing more than $500. Ten children had two of these problems, and three children had three. The total costs of these children, considering all their Medicaid costs, were compared to the total Medicaid dollars spent in their state within the same time period. Over all, 8.6% of the children carried 51.7% of the total costs. Tennessee had the lowest proportion of children: 5.17% of the children accounted for 33.4% of the costs. Iowa had the highest proportion of children

TABLE 4.2

$500+ PROBLEMS' CONTRIBUTION TO STATES' TOTAL COST

State	$\overline{X}$ Months Reviewed	Child	$500+ Conditions Mean and Median	$500+ Conditions Total	State Total	$500+ % of Total	Frequency of $500+ Problems per Child 1	2	3
Texas*	23.0	# of People	——	38	338	11.2%	33	4	1
		Problems	——	44	-	-			
		Cost per Child	Mean =$1539 Median = $928.50	$58,471	$99,791	58.6%			
Iowa	20.2	# of People	——	34	282	12.1%	29	3	2
		Problems	——	41	-	-			
		Cost per Child	Mean = $1567 Median = $1212.50	$53,271	$91,920	58.0%			
California (except Contra Costa)	11.9	# of People	——	15	262	5.7%	14	1	0
		Problems	——	16	-	-			
		Cost per Child	Mean = $1496 Median = $1127	$22,439	$44,170	50.8%			
Contra Costa	18.6	# of People	——	7	65	10.8%	6	1	0
		Problems	——	8	-	-			
		Cost per Child	Mean = $1279 Median = $1048	$8,952	$19,386	46.2%			
Tennessee	13.6	# of People	——	18	348	5.17%	17	1	0
		Problems	——	19	-	-			
		Cost per Child	Mean = $1138 Median = $1054	$20,489	$61,263	33.4%			
Totals	17.5	# of People	——	112	1295	8.6%	99	10	3
		Problems	——	128	-	-			
		Cost per Child	Mean = $1461 Median = $1103.50	$163,622	$316,530	51.7%			

*without Dental

where 12.1% of the children accounted for 58% of the total state cost. In general, each percentage point of children with high cost problems took 4-6% of the state's total Medicaid funds. In California, each percent used 8.9% of the funds.

An attempt was made to determine if any of these high cost problems were treated only due to the presence of a screening effort. Each child who had a condition costing more than $500 is listed in Appendix E with their cost breakdown. Only 22% of the high cost problems were first reported at the time of the screening. Some of these, however, may have been found eventually without a screening effort such as pneumonia, tonsillitis, and Failure to Thrive. Of Those first reported before the screening, 40% were from periodic screens. This would add another 12% of the total high cost problems to the list of those that possibly were due to screening. However, of these, some also would have been appearing regardless of the screening effort, such as bronchitis, broken femur, fractured arm, perhaps tonsillitis, pneumonia. It is therefore estimated that an absolute maximum of 30% of the high cost problems getting treatment were due to the screening program. It is likely that many of this 30% may also have been treated without the screening program. On a problem-by-problem basis, it was difficult to tell whether or not the costs would have been incurred in the absence of a screening effort. Only conditions like convulsions, drug reactions, polio, menningitis, appendicitis could be absolutely separated from the screening effort. However, since the data is available in Appendix L, other analyses are possible by the interested reader.

CHAPTER 5

Screen Related Costs

Since, as discussed in the two previous chapters, the total Medicaid cost change is not an adequate indicator of EPSDT impact on treatment costs, the major focus of this study was to study those treatment costs that could be identified as pertaining to EPSDT referred conditions. Due to a problem of missing ICDA codes in the Michigan printouts at HSRI, only the dental and vision costs could be tracked for Michigan. However, all costs were tracked for the other states (except Texas, where no dental data was available).

For each child and each problem on the screening sheet, the paid claims file was studied for the time period prior to the date of the screening for which data was available, and the time after screening,in search for just those payments made by Medicaid for the treatment of that particular condition found in screening. Those costs are termed "screen-related" costs. In tables presented later, it will be shown that some of the problems found in screening (even on initial screens) were not new and, therefore, costs were incurred for the same problems during the period prior to the screening. Those cost will be referred to as "before screening screen-related costs."

The most frequent question with regard to screening related treatment costs concerns the new expenditures that the Medicaid agency will incur due to children getting involved in the screening activity. One approach is to determine the screen related costs incurred after screening for a child having a particular problem, and then subtract the costs incurred prior to screening for that same problem. The result is termed net new screen related costs.

Another method is to determine the costs which were related to screening detected problems only for those children having no costs for that problem prior to screening on their initial screens.

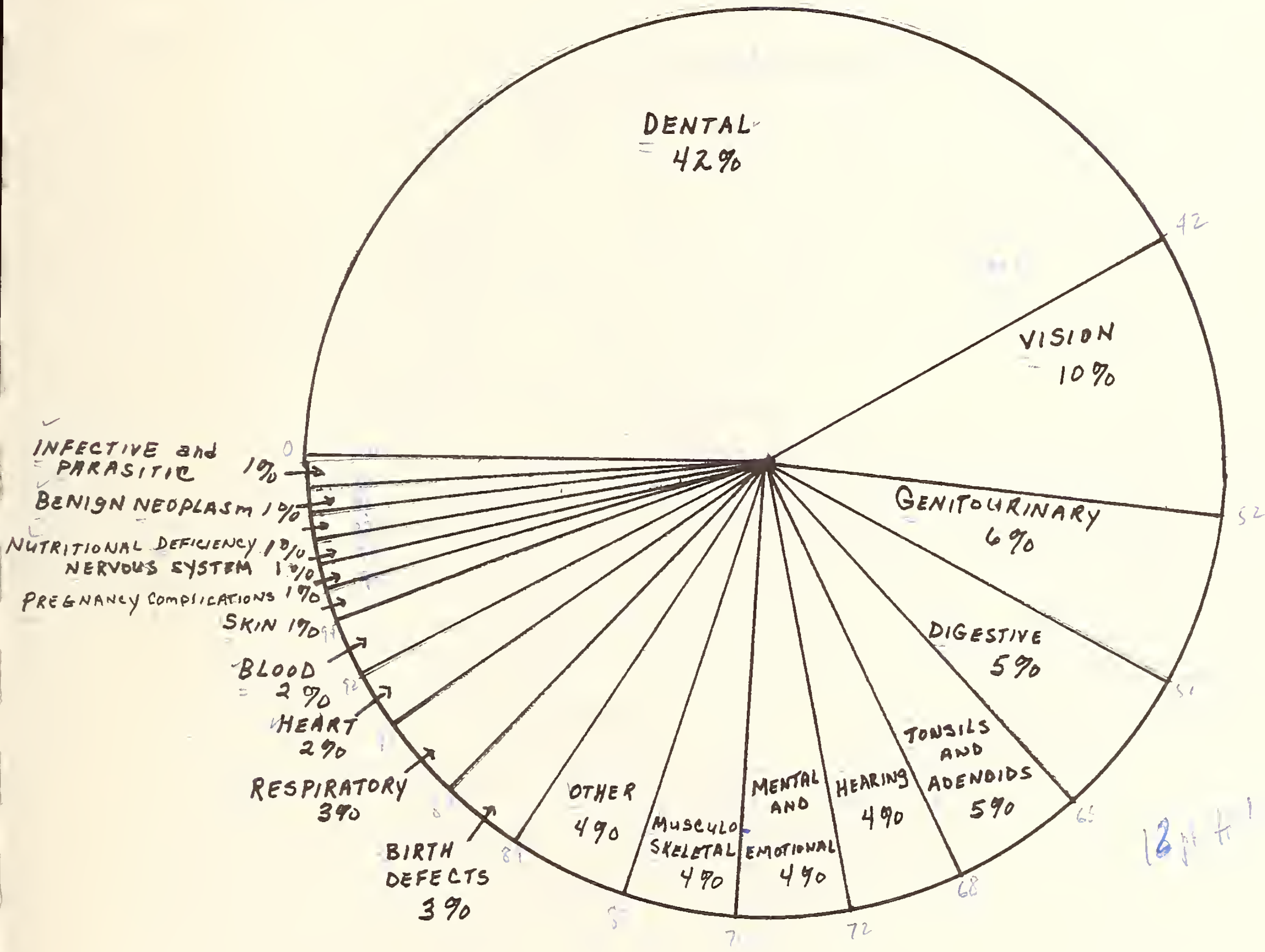
Still another method would be to look at the problems found and have a clinician determine whether or not these costs would have occurred regardless of the screening activity in an acute care environment. This last technique becomes extremely subjective, so was not attempted in detail, but it was discussed at the end of Chapter 4. The data to be presented in this chapter does allow the first two methods to be used.

As described in the Methodology section, certain types of detailed cost data on the problems being treated as reflected by the claims profile were only available for the time period following the date of screening---and even then, this was limited to dental and vision problems in Michigan. Information from different states was combined where appropriate, and the Figure 5.1 represents the dollar distribution of screen related costs occurring after screening, grouped by ICDA category. Dental costs are clearly the overwhelming factor in screen related costs for treatment that occurs after screening, with vision, genitourinary, digestive, tonsils and adenoids, mental-emotional, and hearing problems each representing greater than 3% of the total costs. When the dental category is removed from the set of problems, the same ordering remains, but the distribution is easier to see in Figure 5.2. The ICDA groupings used to combine problem descriptions,and the ICDA codes comprising the categories, are shown in Appendix D. There are more vision and hearing problems in the total data set than indicated in that appendix because there was also a non-ICDA check box for dental, vision, hearing, and hematocrit on the coding form sued for the Nine State Study.

The distributions shown in the pie-graphs are only slightly different when considering initial screens. When the costs for children with no previous

Figure 5.1

Distribution of Total Screen Related* Dollar Costs That Occur After Screening (10 Months of Data) (Medical and Dental)



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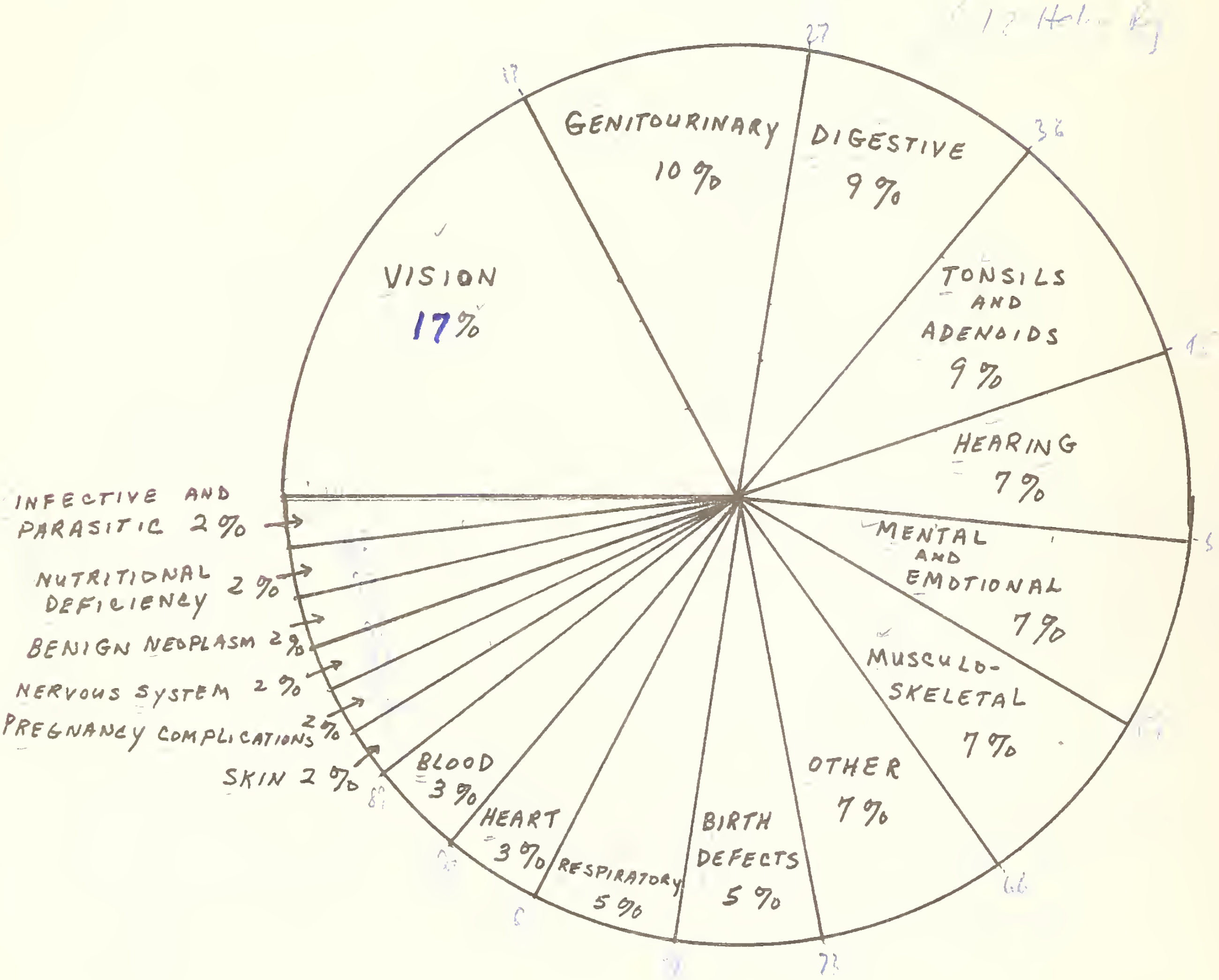
*"Screen-related" means that only the costs for treating problems recorded on the screening sheet were counted up.

Figure 5.2

Distribution of the Total Screen Related Costs
After Screening (Medical Costs Only)



paid claims for the screen related problems are studied, there appears to be a larger percent dental and vision (52% and 20%) than shown in the Figure 5.1. Children with no prior dental or optometric services would be expected to have dental and vision problems in screening. The conclusion remains, however, that dental and vision problems are the ones that generate the majority of the costs which are screen-related due to the volume of conditions referred from screening in these two areas. The data for Figure 5.1 came from Table 5.1. This table and others will be presented in following paragraphs.

Persons planning to conduct EPSDT programs and trying to budget programmatically for such programs often ask what the cost will be for the resulting treatment. The answer depends upon the types of problems referred, the percent of each that show for treatment, and the percent of those who show for treatment that will generate costs. Another consideration may also be the level of ongoing treatment for similar conditions.

Tables 5.1 through 5.2 were included to assist in this program budgeting process. Table 5.1 shows the number of children in our total sample which went into the computation, and the unit cost for those numbers that apply for each problem area. For example, 1,375 children who had a problem of some kind had data available from which to compute the costs of dental care resulting from screening, if there were any (most of the categories have 1,295 children because only dental and vision could be tracked accurately in the Michigan data). Out of the 1,375 with any problem, 786 children had a dental problem and, of these, 513 showed for treatment. Only 436 of the 513 showing for treatment had payments by Medicaid to a dentist. This difference between 513 and 436 comes from several sources: (1) the treatment is rendered but the bill is not submitted; (2) the bill is submitted, but not paid; or (3) insufficient time had passed

Table 5.1

Unit Costs of Treating Screening Related Problems from
5 State Study* for 1975-1976
for Costs After Screening

	Number with:				After Screening Cost Per:					
Category Description	Any Problem	This Problem	This Problem and Showed	This Problem, Showed, had Costs	Child with Any Problem	Child with This Problem	Child Showing for This Problem	Child Having Costs for This Problem	Per Child Regardless of Costs Before Screen	Per Child With No Cost Before Screening Related to the Screen Finding
Dental	1375	786 (740)	513 (482)	436 (410)	30.55 (67.31)	53.44 (81.97)	81.79 (89.37)	96.23 (89.48)	31.56	43.56
Vision	1713	425 (321)	328 (248)	292 (221)	7.27 (30.42)	29.08 (55.94)	37.67 (61.13)	42.32 (63.24)	4.26	17.53
Hearing	1295	141	104	77	1.267 (28.48)	25.37 (84.03)	34.40 (100.16)	46.45 (108.45	.76	1.38
Hematocrit Positive	1295	82	63	19	0.552 (5.75)	8.72 (21.70)	11.35 (24.24)	37.63 (31.09)	.72	.70
Infective	1295	36	31	16	0.39 (6.86)	14.06 (39.27)	16.32 (41.96)	31.63 (54.81)	.22	.22
Benign Neoplasm	1295	8	6	5	0.91 (24.7)	146.50 (297.9)	195.33 (335.9)	234.0 (360.06)	.34	.34
Nutritional Deficiency	1295	57	34	10	0.64 (17.68)	14.75 (83.75)	54.1 (205.5)	84.1 (105.22)	.21	.17
Blood	1295	43	29	6	0.73 (1.30)	2.19 (6.88)	3.24 (8.2)	15.67 (11.99)	.004	.004
Mental, Emotional	1295	39	20	12	2.68 (55.69)	88.92 (312.62)	173.4 (424.31)	289 (523.95)	1.38	1.33
Nervous System	1295	3	2	1	0.06 (2.17)	26.00 (45.03)	39.00 (55.15)	78.00 (0)	0	0
Heart	1295	78	59	33	1.34 (18.5)	22.32 (72.65)	29.51 (82.41)	52.76 (105.09)	.99	.98
Respiratory	1295	101	86	59	2.04 (20.95)	25.80 (71.02)	30.30 (76.14)	44.17 (88.72)	2.69	1.61
Digestive	1295	17	15	10	3.72 (72.53)	283.29 (584.22)	321.07 (614.07)	481.6 (707.58)	1.82	1.81
Genitourinary	1295	70	45	34	4.04 (42.34)	74.70 (168.12)	116.20 (198.48)	153.79 (215.79)	3.71	3.69
Pregnancy and Related Complications	1295	3	2	1	0.37 (13.37)	160.33 (277.71)	240.50 (340.12)	481.00 (0)	.66	.66
Skin	1295	56	39	18	0.35 (3.80)	8.00 (16.66)	11.49 (18.99)	24.89 (21.29)	.33	.33
Musculoskeletal	1295	75	45	31	2.66 (49.76)	45.88 (203.201)	76.47 (258.94)	111.00 (307.21)	3.01	2.99
Birth Defects	1295	23	18	13	1.94 (42.47)	109.35 (306.27)	139.72 (341.89)	193.46 (392.86)	.44	.40
Other	1295	117	86	41	2.57 (31.87)	28.47 (102.89)	38.73 (118.52)	81.24 (162.21)		
Tonsils & Adenoids	1295	42	34	23	3.74 (45.53)	115.45 (228.47)	142.62 (246.71)	210.83 (276.16)	5.67	4.75
Totals (except for dental, vision)	1295	2202 (2052)	1559 (1448)	1137 (1040)	72.28	43.11 (124.55)	61.92 (147.59)	81.99 (163.73)	60.54	83.27
Totals without dental & vision		991	718	409	34.46	39.94 (161.05)	56.96 (191.79)	89.15 (238.48)	33.24	22.18

*Michigan was not included for problems other than dental and vision due to lack of appropriate ICDA codes on the printouts

**Calculated from Table by multiplying cost per child x No. with costs and dividing the result by the No. of children with any problem.

(STANDARD DEVIATIONS IN PARENTHESIS)

Table 5. 2

Unit Costs of Treating Screen Related Problems From the Five State Study For Iowa, Texas, and Contra Costa to Show the Relation of Costs for Such Problems as They Occur Before and After Screening

	Number with:				Before Screening Costs per Child:				After Screening Costs per Child:				New Costs After Screening:			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed, had Costs	Any Problem	This Problem	This Problem Showed	This Problem Showed, had Costs	Any Problem	This Problem	This Problem Showed	This Problem Showed, had Costs	Any Problem	This Problem	This Problem Showed	This Problem Showed had Costs
Dental	765 (685)*	391 (350)	276 (247)	234 (209)	3.58 (20.5)	7.01 (28.32)	6.36 (27.18)	6.42 (27.24)	25.52 (57.04)	49.92 (71.91)	70.55 (76.56)	83.22 (76.66)	21.94	42.91	64.19	76.8
Vision	1103 (625)*	268 (166)	221 (137)	202 (125)	1.72 (34.75)	11.57 (91.53)	6.71 (51.53)	7.05 (50.40)	4.76 (12.82)	31.70 (67.87)	38.45 (73.04)	42.07 (75.42)	3.04	20.12	31.74	37.31
Hearing	685	84	71	54	1.81 (39.54)	29.14 (168.32)	34.20 (194.23)	43.03 (234.34)	1.32 (11.6)	21.49 (42.69)	25.42 (45.48)	33.43 (49.54)	-.49	-7.65	-8.78	-9.6
Hematocrit	685	33	27	13	.02 (.35)	.06 (.36)	.07 (.39)	.15 (.58)	.60 (5.51)	12.45 (22.48)	15.22 (24.1)	31.62 (26.42)	.58	12.39	15.15	31.47
Infective	685	27	23	15	.02 (.61)	.59 (3.08)	.70 (3.34)	0 (0)	.72 (9.40)	18.15 (44.69)	21.30 (47.85)	32.67 (56.58)	.70	17.56	20.6	32.67
Benign Neoplasm	685	3	2	1	0 (0)	0 (0)	0 (0)	0 (0)	.02 (.49)	4.33 (7.51)	6.5 (9.19)	13 (0)	.02	4.33	6.5	13
Nutritional Deficiency	685	31	21	7	.09 (2.29)	1.935 (10.78)	2.86 (13.09)	(0)	.26 (3.25)	5.65 (14.48)	8.33 (17.05)	25.0 (21.99)	.17	3.715	5.47	25
Blood	685	37	27	5	.05 (.85)	.84 (3.6)	.15 (.77)	0	.12 (1.72)	2.20 (7.16)	3.00 (8.27)	16.20 (13.33)	.07	1.38	2.85	16.2
Mental, Emotional	685	24	16	11	3.00 (55.14)	85.71 (288.14)	126.38 (349.20)	155.46 (414.91)	4.93 (76.45)	140.75 (392.23)	211.13 (469.09)	307.09 (545.58)	1.93	55.04	84.75	151.63
Nervous System	685	2	1	1	.04 (1.03)	13.50 (19.09)	27.00 (0)	27.00 (0)	.11 (2.98)	39.00 (55.15)	78.00 (0)	78.00 (0)	.07	25.5	51	51
Heart	685	54	42	24	0	0	0	0	1.89 (24.43)	23.94 (84.64)	30.79 (95.11)	53.88 (121.77)	1.89	23.94	30.78	52.88
Respiratory	685	57	54	38	5.44 (85.53)	65.44 (285.00)	69.07 (292.52)	44.37 (138.42)	2.73 (27.85)	32.84 (92.03)	34.67 (94.26)	49.26 (109.49)	-2.71	-32.6	-34.4	4.89
Digestive	685	13	11	8	.68 (17.80)	35.85 (129.25)	42.36 (140.50)	58.25 (164.76)	4.96 (83.85)	261.15 (572.95)	308.64 (614.66)	424.38 (695.41)	4.28	225.3	266.28	366.13
Genitourinary	685	55	40	33	.58 (14.14)	7.20 (49.82)	9.90 (58.39)	12.00 (64.26)	7.39 (57.69)	92.11 (184.98)	126.65 (207.10)	153.52 (219.14)	6.71	84.91	116.75	141.52
Pregnancy and Related Complications	685	2	2	1	0 (0)	0 (0)	0 (0)	0 (0)	.70 (18.38)	240.5 (340.12)	240.5 (340.12)	481 (0)	.70	240.5	240.5	481
Skin	685	28	22	12	.17 (2.15)	4.11 (10.01)	3.23 (9.40)	4.17 (11.42)	.42 (4.48)	10.25 (20.08)	13.05 (21.91)	23.92 (25.16)	.25	6.14	10.27	19.75
Musculoskeletal	685	33	19	14	.04 (.70)	.91 (3.12)	1.58 (4.02)	1.07 (2.73)	2.13 (40.83)	44.12 (183.63)	76.63 (239.40)	104.00 (276.21)	2.09	43.21	75.05	102.93
Birth Defects	685	17	15	12	7.84 (169.55)	315.82 (1060.91)	357.93 (1127.02)	88.17 (305.42)	2.13 (42.35)	86.00 (262.68)	97.47 (278.68)	121.83 (309.20)	-5.71	-229.82	-260.46	33.66
Other	685	87	63	31	.16 (3.33)	1.26 (9.33)	1.75 (10.94)	3.55 (15.52)	3.54 (40.43)	27.85 (110.96)	38.46 (129.09)	78.16 (176.73)	3.38	26.59	36.71	74.61
Tonsils & Adenoids	685	28	24	17	.22 (2.31)	5.39 (10.29)	5.96 (10.94)	6.24 (11.67)	5.37 (55.18)	131.39 (244.90)	153.29 (258.61)	216.41 (285.77)	5.15	126	147.33	210.17
Totals	685	949 (1,131)*	716 (864)	517 (631)	25.46	17.14 (168.46)	20.09 (190.62)	16.12 (112.34)	$69.62	$41.17 (134.36)	$58.24 (151.33)	$77.65 (176.39)	44.16	27.58	38.41	63.87
Total Without Dental and Vision		(615)*	(480)	(297)	20.16	19.88 (222.20)	30.97 (252.18)	26.76 (158.14)	39.34	45.27 (170.30)	58.02 (191.03)	93.68 (242.43)	19.18	25.39	27.05	66.92

*Sample sizes are adjusted to account for lack of non dental and vision problems in Michigan so as to give appropriate weighting to each dollar figure.

(average of 10.5 months) for the bill to appear in the Medicaid system. The costs given in the table reflect average dollars per each level of analysis given in the first four columns. The dental costs after screening were shown to be $53 per child with a problem referred (plus or minus $7 for a 95% confidence interval*), but were $82 per child who showed for treatment of a dental problem, and $96 per child who showed for treatment and had a bill paid.

Unless bills are generated only when a child has a true problem, Medicaid is getting a good deal from the dentists in paying only $82 instead of $96 per problem. This may be good, but may also indicate why providers are, in general, not terribly excited about participating in the Medicaid program.

The totals at the bottom of the table reflect the summary figure: the screen related costs after screening are approximately $72 per child with any problem, $42 per problem referred, $61 per problem showing for treatment, and $80 per problem with costs to be paid. In generating the totals, a weighted average of the means for each problem category had to be computed. Also the dental and vision costs were available for more states than the data for other conditions. Therefore, the sample sizes were adjusted in the dental and vision categories to give the same sample base of numbers available for all the other conditions. In this way, the dental and vision got included in the correct proportions of the total problems. These new sample sizes are shown in parentheses in the sample size columns. The weighted average total cost was computed using these sample sizes. In addition, the dental and vision costs were subtracted, leaving the total "other medical costs." The last two columns in Table 5.1 were generated from charts containing data for selected groups of children. The after-screening cost per child with any problem column was used to produce Figure 5.1.

---

*1.96 x (Standard Deviation $\div \sqrt{n}$)

Additional tables of after-screening screen-related costs are found in Appendix F. These tables show the breakdown of these costs by age. They can be summarized as follows:

	All Screens	0-4	5-12	13-21	All Orig. Screens	All Periodic Screens	Only those original Screens with no Screen-Related Cost Prior to Screening
Cost per child with one or more problems	$72	$40	71	77	$60	70	61
Cost per problem referred	43	31	45	48	41	43	
Cost per problem showing for treatment	62	45	64	65	61	62	
Cost per problem with treatment costs	82	69	82	82	81	76	77

As can be seen, the only variable shown here affecting the per child or problem costs is age with the 0-4 children having much lower costs--primarily due to the dental problems which occur more frequently in the children over age 6.

Table 5.2 shows similar figures for those states having before and after screen costs available. This allows a determination of the new new screen related costs because the costs incurred before screening by children for a given problem can be subtracted from the costs occurring after screening. Although the dental costs after screening are $3 per problem below those shown in Table 5.1

for a larger number of states, the total costs per problem after screening are amazingly close considering that more states were included in the earlier chart. The net new costs generated by EPSDT screening and related treatment could be viewed as $44 per child with any problem, $28 per referred problem, $38 per problem showing for treatment, and $63 per problem having costs available (with each having a range of approximately plus or minus $8 to give a 95% confidence interval). However, if the distribution of problems differs from those shown here, the planner would have to use the detailed ICDA grouping costs for more accurate planning.

Detailed tables by age, original and periodic screens, etc. are shown in Appendix G. These will be summarized in the following paragraphs. Table 5.3 through 5.5 reflect the averages in unit costs by each age group (0-4, 5-12, 13-21). Within each table and age group is shown the unit cost before and after screening as well as the new new costs for dental, vision and other medical problems. In Table 5.3, a special column is inserted in parenthesis because the categories of respiratory and birth defects had two or three children with extremely high costs before screening. Since the problem for which the high costs incurred were reported in screening, this greatly distorted the average net new costs. Therefore, the respiratory and birth defect problems were omitted in this table only.

Again, it can be seen that the net new costs that will be incurred is considerably lower for the 0-4 children due to the lower rate of dental and vision conditions.

Just as the after-screen costs were summarized, the net new screening costs can be summarized as follows with a row entitled cost per child screened added to provide a perspective on the total costs of screening that treatment related for dollars not previously being spent.

Table 5.3

Screen Related Unit Costs for Children Age 0-4 Having Before and After Costs Available

	Dental	Vision	Other Medical		Total	
Key	After Screen Before Screen Net	After Before Net	After Before Net		After Before Net	
Per Child* Screened (estimate)	2	0	7		9	
Per Child with any Problem	8 1 7	1 1 0	32 47 -15	26 4 22 **	41 49 -8	(35) (6) 29
Per Problem	33 5 28	24 24 0	29 44 -15	24 5 19	29 33 -4	26 7 19
Per Problem Showing for Treatment	53 8 45	32 30 2	37 52 -15	38 6 32	39 43 -4	34 9 25
Per Problem with Costs After Screening	67 10 57	33 32 1	66 30 36	74 10 64	60 27 33	53 12 41
% of Total Problems	19%	12.5%	67.9%		100%	
% of Net New Costs per Child with Problem	.2%	0	75.8%		100%	
% Show	61.5%	73.8%	79.7%		75.4%	

---

* Estimated by multiplying net cost per child with a problem by .3 (assuming 30% have one or more problems--see April 1976 NCSS Report .

** These costs were obtained by deleting the respiratory and birth defect conditions.

Total Net Costs

Unit Cost Definition	All Screens	0-4	5-12	13-21	All Orig. Screens	All Periodic Screens	Original Screens, No Cost Before
Cost per child Screened*	$23	$ 9	$36	$29	$27	$22	$29
Cost per child with one or more problems	55	30**	71	58	64	52	68
Cost per problem referred	32	17	39	30	28	31	-
Cost per problem showing for treatment	41	30	51	45	40	45	-
Cost per problem with treatment costs	61	51	68	55	65	64	71

This summary is a distillation of Table 5.6 which, in turn was a more detailed summary of the Tables 5.3 to 5.5. Table 5.6 provides a perspective of the role of dental and vision problems on the total net new costs of treatment engendered by EPSDT that for children with problems who are over age 4, dental problems constitute 37% to 58% of the costs.

Tables 5.6 should be of greater use to individual state planners who can get good estimates of the percent of children screened in each age group with dental, vision, or other problems.

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*under the assumption (based on NCSS Report for April 1976-all states) that the age distribution of children screened was 38% age 0-4; 19% age 5-12; and 43% age 13-21; and that 30% of children age 0-4 had one or more problems, and 50% of children age 5-21 had a problem.

**was computed by elininating 2 specific problem categories with exceedingly high dollar costs prior to screening as described in the text.

Table 5.4

Screen Related Unit Costs for Children Aged 5-12 Years Having Before and After Screen Costs Available

	Dental	Vision	Other Medical	Total
Key	Before Screen After Screen Net	Before After Net	Before After Net	
Per Child* Screened (estimate)	13	2	$21	$36
Per Child with any Problem	31 5 26	5 1 4	45 4 41	81 10 71
Per Problem	48 7 41	28 5 23	59 6 53	45 6 39
Per Problem Showing for Treatment	68 6 62	33 5 28	71 8 63	58 6 52
Per Problem with Costs After Screening	81 5 76	36 5 31	117 9 108	74 6 68
% of Total Having Problems	35.7%	30.8%	33.5%	100%
% of the net new Cost Per Child With Any Problem	36.6%	5.6%	57.7%	100%
% Show	70.6%	82.5%	75.9%	76.0%

---

*Estimated by assuming that 50% of the children have one or more problems. (See April 1974 NCSS Reports).

Table 5.5

Screen Related Unit Costs for Children Aged 13-21 Years
Having Before and After Screen Costs Available

Key	Dental	Vision	Other Medical	Total
	Before Screen	Before	Before	Before
	After Screen	After	After	After
	Net New Cost	Net	Net	Net
Per Child* Screened (estimate)	$17	$2	$10	$30
Per Child With Any Problem	39	9	37	85
	5	4	17	26
	34	4	20	59
Per Problem	62	40	48	48
	8	17	28	18
	54	23	20	30
Per Problem Showing For Treatment	82	47	60	60
	7	3	35	15
	75	44	25	45
Per Problem With Costs After Screening	93	52	91	73
	8	4	52	18
	85	48	39	55
% of Total Problems	26.3%	39.9%	33.8%	100%
% of Total Costs Per Child with Any Problem				
% Show	75.0%	84.8%	79.1%	80.3%

---

*Estimated by assuming 50% have one or more problems. (See April 1976 NCSS Reports).

Table 5.6

New New Unit Costs for Dental, Vision, and Other Medical Conditions

Unit Cost Definition	All Screens By Age Group 0-4 Yrs. N = 200	 5-12 Yrs. N = 308	 13-21 Yrs. N = 177	 All Ages**	All Original Screens (N = 362)	All Periodic Screens (N = 292)
Costs Per Child With One or More Problems						
Dental	$ 7	$26	$34	$22	$25	$17
Vision	0	4	5	3	3	3
Other Medical	23* (-14)*	41	19	30 (19)	36	32
Total Cost Per Child with One or More Problems	$ 30* (-7)	$71	$58	$55 (18)	$64	$52
Costs Per Problem						
Dental	$28	$41	$54	$43	$48	$33
Vision	-1	22	23	20	22	18
Other Medical	18 (-15)*	53	20	33 (25)*	28	34
Total Cost Per Problem	$17 (-5)	$39	$30	$32 (29)		
Costs Per Problem Showing						
Dental	$45	$63	$76	$65	$66	$62
Vision	1	28	43	32	37	24
Other Medical	32 (-16)*	63	25	42 (27)*	40	43
Total Costs Per Problem Showing	$30 (-4)	$51	$45	$41 (39)		
Costs Per Problem With Treatment Costs						
Dental	$57	$76	$85	$77	$79	$76
Vision	2	31	48	35	39	32
Other Medical	64 (+36)	108	38	76 (67)*	65	71
Total Costs Per Problem With Treatment Costs	$ 51 (34)	$68	$55	$61 (58)		

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*Actual data reflected a decrease in costs for other problems, but this was distorted by two or three persons with very high cost items prior to screening in respiratory and birth defects.

**This column of numbers was computed by computing weighted averages of the first three colums. The means were weighted by the sample size in each category. These sample sizes are available in Appendix G .

TABLE 5.7

Regression of Screen Related Costs for Various Problems for Children who had those Problems (Regardless of Whether or not They had Costs) for Determining Factors Related to Cost Per Problem. Costs Are for 5 States Unless Otherwise Specified.** (Heart and Respiratory did not Relate to other Variables and other Diagnostic Categories had Samples too Small to give Meaningful Results)

Dependent Variable (Average ± 957. Confidence Inter.)	Dental Costs ($55 ± 6)	Vision Costs ($30 ± 6)	Hearing ($28 ± 18)	Hematocrit ($9 ± 5)	Genitourinary ($75 ± 39)	Musculoskeletal ($45 ± 46)	Other ($28 ± 19)	Tonsillitis ($115 ± 69)
Selection Criteria	Had Dental Problem Age 4-12	Had Vision Problem Age 4-12 All States	Had Hearing Problem All Ages Not Mich.	Had Hematocrit Problem at Screen All Ages Not Mich.	Had Genito-Urinary Problem at Screen All Ages Not Michigan	Had Musculoskeletal Problems All Ages Not Mich.	Had Other Problems All Ages Not Mich.	Had Tonsillitis and Adenoid Problems All Ages Not Mich.
N	735	388	58	82	70	75	117	42
R^2	0.14	0.06	0.32	.19	.27	.09	.05	.40
F_{CALC}	41.42	26.64	6.23	6.12	8.15	3.86	3.26	8.47
Degrees of Freedom	3,731	1,386	4,053	3,078	3,066	2,072	2,114	3,038
Constant	20.73	6.84	-53.32	9.78	-82.47	-37.03	-10.14	144.58
Independent Variables \ Regression Coefficients	Coefficient (Standard Error) [Average]							
Age 5 1 = Age 5-9 0 = Other Age			47.58 (17.73) [.41]			111.10 (49.78) [.29]		
Age 13 1 = Age 13-21 0 = Other Age	14.62 (6.09) [.32]			18.33 (8.51) [.09]				
Rural 1 = Rural 0 = Other				15.10 (5.67) [.18]				-230.97
Iowa 1 = Iowa 0 = Other	25.9 (7.74) [.16]				98.04 (43.42) [.21]			
Tennessee 1 = Tenn. 0 = Other States			74.9 (24.69) [.17]	-16.94 (4.88) [.30]				
Showed for Trtmt. 1 = Show 0 = No Show	58.82 (5.77) [.58]	32.6 (6.32) [.72]	53.90 (18.61) [.62]		123.42 (37.81) [.64]	83.87 (46.26) [.60]	35.88 (21.2) [.74]	
Male 1 = Male 0 = Female			34.39 (17.38) [.45]		110.48 (35.75) [.51]			
Texas 1 = Texas 0 = Other States							$34.92 (19.6) [.35]	198.04 (62.64) [.33]
Contra Costa Cty. 1 - Contra Costa 0 = Other Sites								392.42 (62.64) [.02]

** Variables considered were sex, periodicity, rural versus urban, need for immunization, age group, state, show for treatment according to 9 State Study.

A comparison of Tables 5.1 and 5.6 gives the range of alternate estimates of the costs involved. Note that the ranges are (*per child with one or more problems*)

Dental	\$22 - 32
Vision	\$ 3 - 4
All Other Medical Problems	\$30 - 33

and per problem:

Dental	\$43 - 53
Vision	\$20 - 30
All Other Medical Problems	\$25 - 33

for the age distribution present in the sample.

In an attempt to discover the relationships between the screen related costs after screening, and other available variables, the regressions in Table 5.7 were generated by using the screen related costs after screening for the problem category in question. While the coefficient of determination (R^2) is quite low on all of them, the factors included in the table did cause significant differences (at the $\alpha = .05$ level). The factors most often affecting the cost were, of course, whether or not they showed for treatment, and the age group. In the dental area, Iowa had lower costs than average after screening, other things being equal, because there was a high usage of dental services prior to the screen. The other variables generally were included because a particular child or two in a particular state generated an extremely high cost for the problem in question. Detailed review of the individual data breakdowns suggested by the regression revealed no major trends of differences, other than the rate of those showing for treatment, age, and dental in Iowa.

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APPENDIX A

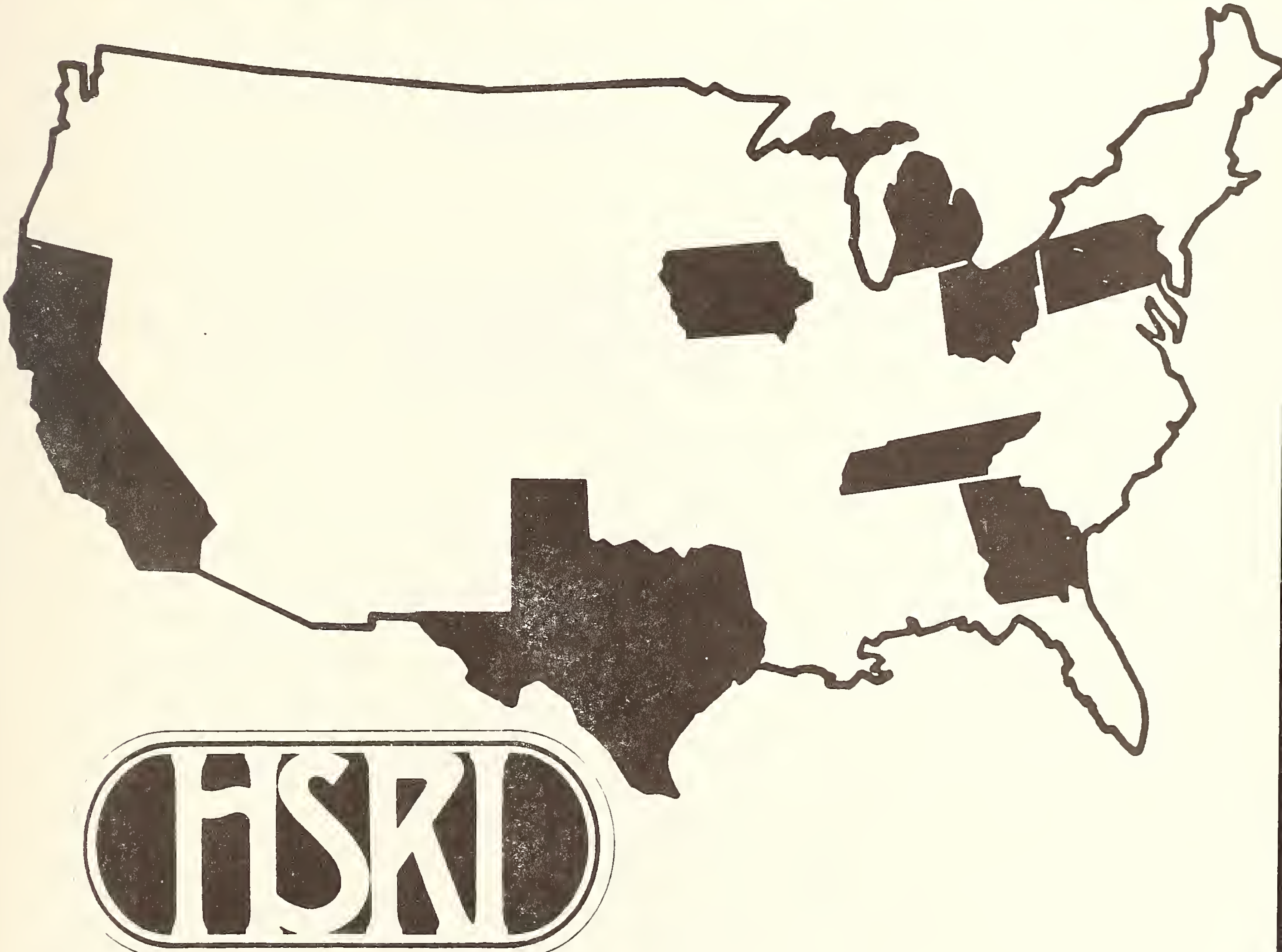
SUMMARY OF EXTRACTS FROM

REVIEW OF SHOWS FOR TREATMENT: A NINE STATE SURVEY

SUMMARY EXTRACTS FROM

Review of Shows for Treatment

EPSDT a nine state survey



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EPSDT

REVIEW OF SHOWS FOR TREATMENT

A Nine State Survey
(October 1976 to March 1977)

March 31, 1977

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March 31, 1977

EXECUTIVE SUMMARY

General

The EPSDT programs of eight states: Texas, Pennsylvania, Georgia, Iowa, Tennessee, Michigan, Ohio, California, and the Commonwealth of Puerto Rico were surveyed by the Health Services Research Institute, The University of Texas Health Science Center at San Antonio, under contract to the Social and Rehabilitation Service, DHEW, during the period of October 1976 to March 1977 to determine the degree to which children with problems found in screening subsequently reached treatment.

The nine jurisdictions at the time of the survey contained 44% of the EPSDT program eligible children in the United States and, coincidentally, also screened 44% of the total children screened under EPSDT in the United States during the third quarter of FY 76.

The screenings, which were subsequently "tracked" in the survey, were generally conducted from January 1, 1976 to April 30, 1976.

Findings[1]

. . The survey found that, of the sample of 3,240 children screened and found to have a problem(s), 2,522 or 78% reached treatment for at least one problem.

These children had a total of 4,782 problems (of all categories), 72%[2] of which, or 3,431, reached treatment.

. . The "show for treatment" rates for the respective major problems were:

Show for Treatment Rates by Major Problem Categories

Dental problems	61.6%	(916 of 1,486 problems)
Vision problems	75.7%	(566 of 748 problems)
Hearing problems	74.7%	(124 of 166 problems)
Hematocrit Related problems	82.4%	(211 of 256 problems)
Other problems	75.9%	(1,614 of 2,126 problems)

.. The rates for both children and problems (1.48 per child with problems) reaching treatment respectively by State are as follows:

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[1] All data in this executive summary are adjusted data in which "treatment refusals" and "no problem apparent" at treatment were deleted. These categories of "terminations" were not considered to be program failures. All substantiating data throughout the balance of this report are reported both as "raw" and "adjusted". There is generally a 5% difference between the two categories of data.

[2] The rate is accurate for possible sampling error within one percentage point, with a 95% confidence interval.

Shows for Treatment

(Children and Problems by State)

	Children		Problems	
	No. of Children	No. & Percent of Children Treated for at Least One Problem Found in Screening	No. of Problems	Percent of Problems Treated[1]
Texas	342	263 (77%)	415	308 (74%)[2]
Pennsylvania	528	466 (88%)	724	628 (87%)
Georgia	311	234 (75%)	506	312 (62%)
Tennessee	384	247 (64%)	619	339 (55%)
Michigan	421	351 (83%)	600	465 (78%)
Puerto Rico	271	179 (66%)	465	288 (62%)
Iowa	287	216 (76%)	463	327 (71%)
California	331	267 (81%)	465	370 (80%)
Ohio	365	299 (82%)	525	394 (75%)
Total	3,240	2,522 (78%)	4,782	3,431 (72%)

THESE DATA, IN THEMSELVES DO NOT INDICATE DEGREES OF EFFICIENCY BETWEEN PROGRAMS SINCE THE RESPECTIVE STATE PROGRAM COSTS ARE NOT INCLUDED IN THIS SURVEY.[3]

[1] There is a possibility of sampling error, but the rates for each State are accurate within four percentage points. Specific rates for each site (80 problems) are accurate to within 10 percentage points.

[2] No dental problems included. Texas has a separately administered EPSDT dental program. Data from this program were not available through the normal EPSDT program sources. An independent evaluation of the Texas dental program in Oct. 1975 indicated a 72% show for treatment rate. Dental treatment at this rate would not significantly alter the finding for Texas. Additionally, it should be noted that the 72% show for treatment rate under the separate EPSDT dental program is higher than in the other 8 states surveyed with integrated medical/dental EPSDT programs (61.6%).

[3] And, as total program costs including case finding, screening, diagnosis, treatment, case monitoring and program management, are generally unknown.

.. The problems that could not be "tracked" to treatment (the no shows, unknowns, and undocumentable) fell into the following categories:

Problems not Documentable as Treated

(No Shows, and Unknown and Undocumentable)

Category	Number in Each Category	Percent in Each Category
On waiting list for treatment	100	6%
Repeated treatment appointment failures[1]	181	11%
Refused treatment	261	15%
Problem no longer apparent[2] (at treatment appointment)	82	5%
No longer program eligible	72	4%
Other - Unknown or undocumentable	998	59%
Total	1,694[3]	100%

Discussion

The above are summaries of data from the State surveys. They represent EPSDT programs conducted under a wide diversity of modes which range from those which are highly oriented on the public health sector to those highly oriented on the private health sector. Each of these modes has a varying impact on the respective subsystems[4] and the totality of the EPSDT program. Additionally, socio-economic variations between States, political traditions, cultural norms, dietary practices, fluorides in water, etc., will contribute to the differences in data between the States surveyed. These data are reported in detail in the respective State annexes.

Other major factors of a structural nature influencing the variations in data between the States were: (1) the differences in intensity of effort in implementing the program demonstrated by the "single state agency" having responsibility for the overall implementation of the program, and (2) the assignment or lack of assignment of case monitoring (follow-up) as a designated function to a specific State agency.

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[1] Two or more.

[2] Self resolved between screening and treatment or false positives.

[3] Unadjusted problems. 1,694 - (261 [refused treatment] + 82 [problem no longer apparent]) = 1,351 (adjusted problems not documentable as treated). This is the difference in the previous table between the total of "number of problems" (4,782) and "problems treated" (3,431); i.e., 4,782 - 3,431 = 1,351.

[4] The subsystem of EPSDT; i.e., (1) case finding (outreach). (2) screening, (3) diagnosis, (4) treatment, and (5) case monitoring (follow-up).

The extreme differences in effectiveness, availability or utilization of management information systems in support of EPSDT programs, per se, in the respective States also contribute significantly to program effectiveness and differences in data. The survey teams concluded from their observations of EPSDT programs in operation at many locations that "show for treatment" performance was oftentimes better in local areas than was documented or reported to and known at higher levels of program management.

Other factors leading to variations in data between the States (and between jurisdictions within States) are the differences in health standards and definitions, particularly as they apply to the screen itself, its components, the tests and measurements, and the determinants of normal/abnormal, and the requirements for treatment (or referral).

As a major comprehensive program for preventive health, EPSDT is unique and with little precedence in this country. Accordingly, comparisons with other programs or expectations of program results are difficult. In the context of the EPSDT program there is the necessity oftentimes to convince a parent or guardian that a seemingly well child "needs to go to the doctor". The probability under such circumstances of achieving a 100% participation in the program or a 100% "show for treatment" of children with sometimes unapparent problems in a voluntary program in this society is exceedingly remote, if not outside the realm of possibility. The categories of "no shows" displayed earlier are tangible evidence to this point. A range representative of a mature and fully effective national program is probably in the area of 80 - 90%. The EPSDT program is now rapidly approaching this range.

All the foregoing factors affecting the comparability of data between jurisdictions are amplified when making such comparisons from a different base. Such is the situation in attempting to compare these data with the EPSDT data reported by the Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, House of Representatives, September 1976[1].

Nevertheless, data that appears reasonably comparable is that pertaining to "eligibles screened who needed treatment and were treated (all categories)" in which the Committee reported 60.4% and this survey 78.0%. In addition to all the qualifications previously expressed concerning the causes for variations in this type program data there are two others that materially affect the differences between the Committee and Survey data. One is that already addressed concerning the diversity that often exists between recorded activity at local levels, and reported activity to higher levels of management (state, national) and actual local level program activity. The Committee data was largely obtained from reported data from State levels and the Survey data from actual case/problem tracking at local level. The second cause for the variation is the difference in time and concomitant program maturation. The Committee data reflects EPSDT state program activity that occurred through early 1975. The

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[1] "Department of Health, Education, and Welfare's Administration of Health Programs: Shortchanging Children". Report by the Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, House of REpresentatives, Ninety-Fourth Congress, Second Session, September 1976.

Survey data reflects program activity through March 1977. The staff of the Health Services Research Institute, which has been active in surveying and evaluating EPSDT programs since 1972-73, has been cognizant of a significant transition in EPSDT, particularly within the last two years, from a screening focused program to a comprehensive screening/treatment program.

The States included in this survey contain classic examples of the two primary structural patterns for "delivering" EPSDT; i.e., (1) screening by the public sector of health and treatment mainly referred to the private sector of health (the two step system), and (2) screening and treatment accomplished generally in a single setting by the private sector of health (the one step system). Texas and Michigan may be termed "two-step" States, and Pennsylvania, Ohio and Iowa "one-step" States. Without any consideration of costs between the respective systems the two-step approach seems to be equally effective in follow-up for treatment, if sound case management is in effect.

Conclusions

.. The finding that 78% of the children screened and found to have problems reached treatment is considered to be reasonably representative of the totality of the EPSDT program in the United States and indicates that EPSDT is maturing into a comprehensive preventive health program.

.. Notwithstanding the increased effectiveness of the overall EPSDT program there are still significant variations in the priority assigned the program in the various States.

.. The foregoing, in part, contributes to the general inadequacy of management information systems available to EPSDT program managers. In many instances, State level managers are unable to provide the type data requested by the Congressional Subcommittee[1] or this survey. In the instance of the survey, team representatives went to local areas to acquire the data by actually "tracking" children from screening to treatment.

.. Program performance was generally better in jurisdictions where the "single State agency" having responsibility for the program was adequately supported in manpower and funds and in which it aggressively pursued and achieved interagency agreements necessary to the success of the program.

.. Program performance, and particularly State level cognizance of the follow-up treatment provided children with problems found in screening, was significantly better in jurisdictions which recognized follow-up (case-monitoring) as a specific function of the EPSDT program and had assigned it to a specific State agency.

.. The combined public sector screening/private sector treatment referral (the "two-step" approach) can be as effective at follow up for treatment as the single setting "private sector screening and treatment" (the one-step approach), if a sound system of case management is in effect. This statement is made without consideration of the total costs of each approach, which are still largely unknown.

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[1] Ibid.

.. There are wide variations within States and between States, and within and between the public and private sectors of health in standards and definitions, particularly as they apply to screening (components of the screen, tests, measurements) and the determinants of normal/abnormal and the requirements for treatment or referral for treatment (note Table 5, Annex A).

.. There are apparently wide variations in the priorities "assigned" for identification and treatment of dental problems in the various States.

BACKGROUND AND PURPOSE OF THE SURVEY
AND
CONDUCT OF THE SURVEY

Background and Purpose of the Survey

In a letter to appropriate commissioners in the various States requested to participate in the survey, the Commissioner of the Medical Services Administration, Social and Rehabilitation Services, DHEW, explained the background and purpose of the survey as follows:

> We are in the process of revising our reporting requirements to include all phases of the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program. These expanded reports will provide us data on the number of children with problems found in screening who receive treatment. In the meanwhile, however, we are in need of at least sample data from a variety of States on this key part of the EPSDT program. For this reason we have contracted with the Health Services Research Institute (HSRI), University of Texas Health Science Center at San Antonio, to do a survey of selected States to study a sample of children screened with problems found who received treatment for these problems. The States selected were those with high numbers of children screened, as reported to the National Center for Social Statistics (NCSS), with some consideration to national and regional representation.

Conduct of the Survey

Assignment of Contract

The Health Services Research Institute, (HSRI) University of Texas Health Science Center at San Antonio was awarded Department of Health, Education and Welfare, Social and Rehabilitation Service, Medical Services Administration contract No. SRS-500-76-0519 on September 27, 1976 to conduct the survey to obtain the needed data (relevant parts in Appendix 1). The Health Services Research Institute has been involved with evaluation of the EPSDT program for approximately four years. It had conducted similar evaluations of State EPSDT programs in 1972 and 1973 and in a more limited context in 1975.

Approach and Methodology

Approach

Preliminary to the survey, HSRI, as stipulated in the contract,

reviewed the report by the Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, "Department of Health, Education and Welfare's Administration of Health Programs: Shortchanging Children", dated September 1976 and met with staff members of the committee in October 1976 for guidance, exchange of information and methodological considerations.

Overall Methodology

The overall approach was to select nine States with high numbers of program eligibles and high levels of program activity as represented by the numbers of EPSDT health screening examinations conducted in those jurisdictions during the third quarter of FY 76. Additionally considered was the national and regional representation afforded by the selected States. A random sample of 400 children with problems found in screening during the period January 1, 1976 to April 30, 1976 was to be drawn from five randomly selected sites per State, representative of both urban and rural programs within the State. In total, this represented 3,600 children who would be "tracked" to treatment to represent the status of the EPSDT program in the United States in general.

Detailed Methodology

The periods for identification of the sample screened, (January 1, 1976 to April 30, 1976), and follow-up to treatment (December 1976 to March 1977 depending generally on the dates of the respective state survey) were considered sufficiently recent in time to represent the current status of programs, yet far enough past to allow adequate time for a child to have reached treatment and for such treatment to have reached documentation at all levels within a State.

HSRI assisted the SRS Project Officer in the selection of the nine states to be surveyed. The MSA summary of the National Center for Social Studies (NCSS) reports of screening for the third quarter, FY 76 was used to determine those regions with the most children screened (Chart I). In order to obtain a regional representation, the percent of all children screened nationally belonging to each region (column 2) was multiplied by nine to determine the number of States from each region to be included in the sample (columns 3, 4).

Chart I

Selection of Regions for the Sample

Region	(1) Number Screened 3rd Quarter '76	(2) Percent of Total Screens	(3) % Screened Times 9	(4) Selected number of states from the Region
I	11,834	.0265	.239	0
II	79,434*	.1780	1.602	1
III	52,738	.1182	1.064	1
IV	115,431	.2587	2.329	2
V	67,192	.1506	1.356	1
VI	51,035	.1100	1.020	1
VII	22,650	.0500	.450	1
VIII	11,888	.0200	.230	0
IX	12,458	.0200	.250	1
X	21,424	.0400	.430	1
Total	446,084			

*Estimated 39,236 for Puerto Rico (they only reported 9,236).

The States were chosen on the basis of the number of children screened and the numbers of conditions referred (Chart II).

Chart II

States Chosen, Alternates, Numbers Screened During Third Quarter FY 76, and Conditions Referred

Region	State Chosen	Number Screened	Conditions Referred[1]	Alternate State	Number Screened	Conditions Referred[1]
II	Puerto Rico	39,236	29,486	New York	26,687	9,089
III	Pennsylvania	33,013	16,993	Virginia	8,226	1,418
IV	Mississippi	15,355	23,282	N. Carolina	11,952	1,983
IV	Georgia	23,024	25,723	Florida	25,622	28,459
IV				Tennessee	13,706	16,988
V	Michigan	26,788	20,249	Ohio	19,945	--
VI	Texas	28,046	15,048	Louisiana	9,479	7,530
VII	Missouri[2]	8,441	4,547	Iowa (in RegionVIII)	6,493	1,719
IX	California	9,747	6,123	Colorado	9,674	7,742
X	Oregon	9,309	13,034	Washington	8,554	3,912

[1] MSA provided data.

Participation of the States was voluntary. Considerable difficulty and delay was experienced in recruiting the chosen States. Mississippi, Missouri, Oregon, Florida, and Washington all declined to participate in the survey. Ultimately the following nine jurisdictions participated: Puerto Rico, Tennessee, Pennsylvania, Michigan, Texas, California, Ohio, Iowa and Georgia. The nine jurisdictions surveyed are representative of 44% of the EPSDT eligible population in the United States, and coincidentally, they had screened 44% of all the children screened in the third quarter, FY 76.

Each State was asked to submit a list of five urban sites (standard metropolitan statistical areas) and five rural (non-SMSA) counties with a minimum of

400 children screened during the sample period. With the approval of the SRS Project Officer, three urban and two rural sites in each State were randomly selected from the ten nominated sites. An effort was made to assure that at least two separate screening locations would be represented in each urban site. Where single rural counties could not provide the minimum sample of screens, multiple contiguous counties were added until a sufficient sample base was established. Each site was asked (through the State offices) to provide HSRI with a list of all children screened during the sample period and found to have a problem(s)--a minimum of 400. (A sample of the HSRI instructional letter to a State is attached as Appendix 2).

The respective sites surveyed in each State were as follows:

Texas

San Antonio
Beaumont
Fort Worth
Lubbock (R)*
Eagle Pass (R)

Pennsylvania

Erie
Pittsburg
Philadelphia
Lock Haven (R)
Chester (R)
Bucks County (R)

Georgia

Savannah
Atlanta
Augusta
Albany (R)
Valdosta (R)

Tennessee

Memphis
Knoxville
Nashville
Hardin County (R)
McNairy County (R)

Michigan

Flint
Grand Rapids
Detroit
Grand Haven (R)
Allegan (R)

Puerto Rico

Bayamon
Ponce
Rio Pedras
Barranquitas (R)
Comerio (R)

Iowa

Cedar Rapids
Council Bluffs
Davenport
Clay (R)
Maquoketa (R)
Ottumwa (R)

Ohio

Columbus
Toledo
Cincinnatti
Middletown (R)
Xenia (R)

California

Los Angeles
Contra Costa
San Bernadino
Sonoma (R)
Ventura (R)

*(R) = Rural Sites

When the lists of children were received by HSRI, each child was assigned a number and then, through a packaged APL random selection program, the sample list of 80 children per site was drawn. HSRI prepared the heading of a State Survey Form for each child, which, with an instructional sheet, was returned to the State for distribution to the sites or directly to the sites if previously approved by the State (sample of State Survey Form and Instructional Sheet are attached as Appendices 3 and 4).

Where dental cases were uniquely prominent in the list of problems, their number was limited to forty of the total sample to assure that there were sufficient numbers of other conditions to "track". It was necessary to employ this limitation in only one state in the selection of the total sample. In instances in which deficient immunizations were listed as problems, these were deleted from the sample. Additional children referred for other causes were then selected randomly until the sample was complete.

Steps were taken throughout to insure confidentiality of child data.

A local health or social worker, nominated by the State EPSDT coordinator, was recruited at each site to conduct the necessary review to complete the HSRI survey forms. Show(s) for treatment was (were) determined by: (1) screening and/or treatment clinic records, (2) welfare records, (3) a telephone call or visit to the treatment provider, (4) a telephone call or visit to the parent/guardian, and (5) Medicaid payment data. Where State regulations permitted, the local worker was nominally reimbursed. These workers completed the HSRI survey form (Appendix 2). An HSRI representative then visited each site where she/he resolved unanswered questions and completed the survey forms to the maximum extent feasible. A random sample of 20% or more of the forms were verified by the representative while at each site. The error rate in the forms verified was uniquely low (3-5%). Medicaid payment claims profiles were requested from each State and, where received, used as an additional source of information about the receipt and confirmation of treatment.

Upon receipt of the completed survey forms at HSRI, they received a 100% review by the HSRI staff and were then edited and analyzed, utilizing SPSS and a special edit program in an IBM 370 computer. Data were then analyzed, consistent with sound statistical methodology and contract requirements. Any deviations in the above methodology are reported where appropriate in the State by State review in the annexes.

The foregoing has detailed the positive elements of the methodology. In summation of the methodology is also appropriate to identify where there were deviations from randomness, i.e.,

- a site had to have screened at least 400 children during the period 1 January 1976 to 30 April 1976 to assure that there would be adequate numbers of "children with problems found" to constitute the groups from which the sample of 80 would be randomly selected. Many sites in the states were therefore excluded from consideration.
- of those sites considered there were extensive variations in the maximum numbers of children screened.
- the decision to utilize three urban sites and two rural sites to assure the urban/rural representation in the states and overall survey was arbitrary, not random.
- the sites vary in the degree to which they find/identify problems in children screened.
- dental and immunization problems were limited or deleted to assure a cross section of type conditions in the samples.

Summary, State and Site Survey Data

Attached, in order, are the following annexes and the data contained therein:

Annex A - Summary of Nine State Data

(1) Narrative

(2) Table 1 - Children with Problems Who Received Treatment at Least Once (Raw and Adjusted) by State

(3) Table 2 - Problems Found at Screening, Percent Treated (Raw and Adjusted) by Major Problem Category and State

(4) Table 3 - Problems Found at Screening, Treated and Other Dispositions by Major Problem Category for Nine States

(5) Table 4 - Problems (all categories) Found at Screening, Treated and Other Dispositions for Nine States

(6) Table 5 - Major Problem Category Distribution by State

Annex B - Report of Texas Survey

(1) Narrative

(2) Table 1 - Problems Found at Screening, Treatment and other Dispositions by Major Problem Category for State of Texas

Table 1A- As above for San Antonio

Table 1B- As above for Beaumont

Table 1C- As above for Lubbock

Table 1D- As above for Eagle Pass

Table 1E- As above for Fort Worth

(3) Table 2 - Total Problems (all categories) Found at Screening, Treated and Other Dispositions by Site

(4) Table 3 - Problems Found at Screening, Percent Treated (Raw and Adjusted) by Major Problem Category and Site

Annex K - Supplemental Information

(1) Problems Found at Screening, Treated and Other Dispositions, by Multiple Problem Category, For Nine States

(2) Number and Percentage of Problems Showing for Treatment for One or More Problems

ANNEX A

SUMMARIES OF THE NINE STATE DATA

Annex A - Summary of Nine State Data

Narrative

1. General

If there is a general organizational pattern to EPSDT in the widely diverse State/county/city organizational structures for the "delivery" of EPSDT in the nine jurisdictions of the survey, it is the consensus pattern of: (1) the State Department of Public Welfare or Social Services having "single agency" overall program responsibility; (2) that same agency having case finding (outreach) responsibility; (3) the State Health Department, under contract to the State Department of Welfare or other administrative arrangement, executing the screening function; (4) referrals of problems found in screening for diagnosis and treatment to private sector health clinics; and (5) case monitoring (follow-up) being the responsibility of the same agency that had the case finding responsibility--the Department of Public Welfare or Social Services.

Yet, even to attempt to analyze the State program structures to seek a common pattern reemphasizes the extreme diversity of the program in its many jurisdictions. In many States, even the internal State structure offers a vast variety of program delivery systems. There are States with exceedingly strong county governmental structures, others with a multi-county regional configuration, others with strong traditional county/city health department configurations (screening, diagnosis and treatment), and others with strong traditional city/county welfare structures. These are variations within the consensus pattern.

Outside the consensus pattern are instances where (1) the State Health Departments have program responsibility; (2) case finding is contracted to health (Pennsylvania) or other type community private organizations; (3) screening is done totally or in part by private sector health providers (Ohio, Iowa);

(4,5) diagnosis and treatment is under contract to private health provider organizations or is a combination private and public sector (Pennsylvania), or rarely, almost totally public sector (Puerto Rico); and (6) *case monitoring* (follow-up) is designated to the provider of treatment or to the health department, or though designated, has had *limited* program *identification and implementation* (Puerto Rico, Iowa, Tennessee, Georgia).

Since this latter characteristic appears to "fall out" and identify with the four States with the lowest rates of "show for treatment", perhaps the overriding conclusion is that those States which have specifically designated case monitoring (follow-up) as a function and have set up systems to implement it have stronger programs than those which have not acted with the same degree of vigor.

Yet, as earlier cautioned, there are a multiplicity of reasons to negate inter-state comparisons. *The major factor is the absence of specific EPSDT program cost data by State*. Variations in expenditures for *program management* obviously differ from State to State, if measured only in terms of "full time equivalent" personnel committed to the program; variations in expenditures for case finding vary significantly, depending upon techniques and means employed. Variations in costs of *screening* appear to vary significantly, depending upon whether the focus is public sector, private sector, or a combination of both; and variations in *diagnosis and treatment* fluctuate within the ranges of the many different formulas for reimbursement of private sector providers; and variations in expenditures for *case monitoring* appear to vary extremely, from almost pennies per child screened in States in which the function (case monitoring) has had weak identification and limited implementation, to an estimated $10-$15 per child screened in which the function has had strong identification and aggressive implementation.

2. Specific Tables

a. Table 1 - Children with Problems who Received Treatment at Least Once, by State

Of children with problems found in EPSDT screening, 77.8% reach treatment for at least one of their problems. In the overall, each child with problems had 1.48 problems.

This may reasonably be concluded to represent the status of the EPSDT program throughout the United States.

b. Table 2 - Problems Found at Screening, Percent Treated (Raw and Adjusted) By Major Problem Category, by State

Seventy-two percent of all problems found in screening reach treatment.

The "show for treatment" rates of designated major categories of problems were:

Dental	61.6%
Vision	75.7%
Hearing	74.7%
Hematocrit	82.4%
Other	75.9%

The lower treatment rate for dental problems indicated appears to result from a more or less "de facto" low priority for dental treatment as compared to other health problems, when viewed in terms of specifically available program dollar authorizations and, in this same context of "de facto" priority, reimbursement rates to dental providers are often not sufficient to draw them into the

EPSDT provider program. A "lack of dental providers" for referral was frequently the concern of local EPSDT program workers. Additionally, the lower treatment rate for dental problems may result from children's fear of dental treatment and a concommittant resistance to parental suasion. This latter situation is frequently reported by local workers and is somewhat reinforced by Table 3, wherein 46% of all "refused treatments" are dental.

c. Table 3 - Problems Found at Screening, Treated and Other Disposition, by Major Categories, for the Nine States

In a systems context, Table 3 reflects that, of 1,695 problems not documented as "showing for treatment", the reasons were as follows:

No Shows(Undocumentable & Unknown)	1,694	(100%)
On waiting list	100	(6%)
Repeated appointment failures	181	(11%)
Refused treatment	261	(15%)
Problem no longer apparent	82	(5%)
No longer program eligible	72	(4%)
Others, Undocumentable & Unknown	998	(59%)

Significant consideration was given to which of the above reasons were EPSDT program failures. It was finally decided to drop the categories of "refused treatment" and "problem no longer apparent" from both the "n" (sample population) and the result in order to reflect a more accurate picture of program performance. The dropping of these two categories produces the adjusted results indicated in the respective tables.

Fifty-nine percent (59%) are in the category of "other, undocumentable and unknown". This category includes "no record of child" in local files; "no record of Medicaid number" in local files; incomplete files; total lack of follow-up indications, etc. In many areas, follow-up appears to hold the lowest priority. Thus, follow-up data was frequently unavailable in either the EPSDT case file or through the EPSDT data system. Further, many times the basic information needed to begin a follow-up tracking was not available (e.g., name of provider to whom a problem was referred, address and telephone number of mother, etc.). This meant that in some cases it was simply impossible to follow up on a problem referred for treatment, especially in areas with highly mobile client population, inadequate communications systems, etc.

d. Table 4 - Total of Problems (All categories) Found at Screening, Treated and Other Dispositions, by State

In a continuation of the analysis of Table 3 above, which reflects "no shows for treatment and other disposition" by problem, this table indicates the same data by State. As previously discussed (General, above) the status (identification and implementation) of the function of "case monitoring" is perhaps the one commonality of program strengths and weaknesses. The large percentages of the total of "Other, Undocumentable and Unknown" and the distribution of this category by State, in itself, appears to bear some semblance to the overall status of State EPSDT programs.

e. Table 5 - Type Condition and the Percent of the State and Nine State Totals

This table indicates extensive ranges of findings of conditions (problems) between State programs, e.g.,

	Low	Percent Conditions Found in State	High	Percent Conditions Found in State
Dental	California	23%	Tennessee	54%
Vision	California	5%	Texas	24%
Hearing	Iowa	1.3%	Pennsylvania	6.2%
Hematocrit	Pennsylvania	1.1%	Georgia	14%
			(Ohio	10.6%)

These data are reported primarily to indicate that these extreme variations in conditions found are more probably indicative of varying standards and definitions than of the real occurrence of the conditions.

TABLE 1
Children With Problems Who Received Treatment At Least Once (Raw And Adjusted) By State

	Number of Children With Problems	Number of Children Treated	Percent Treated	Adjusted* Number of Children With Problems	Number Children Treated	Adjusted* Percent Treated
Texas	368	263	71.5	342	263	76.9
Pennsylvania	579	466	80.5	528	466	88.3
Georgia	313	234	74.8	311	234	75.3
Tennessee	407	247	60.7	384	247	64.3
Michigan	439	351	80	421	351	83.4
Puerto Rico	280	179	63.9	271	179	66.1
Iowa	287	216	75.3	287	216	75.3
California	371	267	71.9	331	267	80.7
Ohio	378	299	79.1	365	299	81.9
Total	3,422	2,522	73.7	3,240	2,522	77.8

*After deletion of "Refused treatment" and "Problems No Longer Apparent" categories.

THESE DATA, IN THEMSELVES, DO NOT INDICATE DEGREES OF EFFECTIVENESS BETWEEN STATE PROGRAMS SINCE RESPECTIVE STATE PROGRAM COSTS ARE NOT INCLUDED IN THIS SURVEY.

TABLE 2

Problems Found At Screening, Percent Treated (Raw And Adjusted), By Major Problem Category

By State:

	Overall Total			Texas			Pennsylvania			Georgia			Tennessee			Michigan			Puerto Rico			Iowa			California			Ohio		
	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta	Np	t	ta
TOTAL	5125	67	71.7	446	69.1	74.2	803	78.2	86.7	522	59.8	61.4	680	50.6	54.8	635	73.2	77.5	490	58.9	61.9	470	69.6	70.6	524	70.6	79.5	555	71.1	75.2
DENTAL	1610	56.9	61.6	0	-	-	243	82.1	82.1	179	52.5	54.3	366	47	51.6	240	70	74	107	33.6	34.3	130	53.8	55.6	121	63.6	71.9	224	59.8	62.6
VISION	795	71.2	75.7	108	67.6	75.3	154	83.3	83.3	89	71.9	72.7	154	64.9	69	101	83.2	86.6	27	11.1	11.5	49	79.6	81.3	27	70.3	79.1	86	80.2	81.1
HEARING	190	65.3	74.7	27	81.5	84.6	50	93.3	93.3	8	62.5	65.5	10	20	22.2	34	61.8	72.4	8	25	25	6	50	50	21	61.9	86.6	26	53.8	70
HEMATOCRIT	269	78.4	82.4	12	83.3	90.9	9	100	100	73	74	74	30	63.3	73.1	12	83.3	83.3	20	75	88.2	6	66.7	66.7	46	84.7	88.6	61	85.2	88.1
OTHER	2261	71.4	75.9	299	67.9	72.2	347	89.8	89.8	173	54.9	57.9	120	41.8	43.4	248	73.4	77.5	328	70.7	75.1	279	75.6	76.2	309	71.8	80.7	158	79.6	85.6

	Overall Total	Texas	Pennsylvania	Georgia	Tennessee	Michigan	Puerto Rico	Iowa	California	Ohio
NUMBER OF CHILDREN	3440	368	579	313	407	439	280	287	371	378
NUMBER OF PROBLEMS PER CHILD		1.22	1.39	1.67	1.67	1.45	1.75	1.64	1.41	1.47

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1: Number of problems found at screening.
2: Percent of problems treated.
3: Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 3
Problems Found At Screening, Treated and Other Disposition,
By Major Problem Category for the

NINE STATES

Major Screening Category	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other Unknown, Undocumented
TOTAL	% 5125 (100)	3431	67.	71.7	100(2.)	181(3.5)	261(5.9)	82 (1.6)	72 (1.4)	998(19.5
DENTAL	1610(100)	916	56.9	61.6	57(3.5)	84(5.2)	119(7.4)	5 (.3)	22 (1.4)	407(25.3
VISION	795(100)	566	71.2	75.7	11(1.4)	21(2.6)	39(4.9)	8 (1.)	14 (1.8)	136(17.
HEARING	190(100)	124	65.3	74.7	2(1.)	8(4.)	11(5.8)	13 (6.8)	0 (0.)	32(16.8
HEMATOCRIT	269(100)	211	78.4	82.4	1(.4)	11(4.1)	7(2.6)	6 (2.2)	0 (0.)	33(12.
OTHER	2261(100)	1614	71.4	75.9	29(1.3)	57(2.5)	85(3.8)	50 (2.2)	36 (1.6)	390(17.

Row Percentages in Brackets

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 4
Total Of Problems (All Categories) Found At Screening, Treated And Other Dispositions, By State

State	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other Unknown Undocumented
Texas	% 446 (100)	308	69.1	74.2	3(.7)	17(3.8)	28(6.3)	3(.7)	26(5.8)	61(13.7)
Pennsylvania	803 (100)	628	78.2	86.7	10(1.3)	18(2.2)	67(8.3)	12(1.5)	11(1.4)	57(7.1)
Georgia	522 (100)	312	59.8	61.4	6(1.2)	36(6.9)	14(2.7)	2(.4)	8(1.5)	144(27.6
Tennessee	680 (100)	339	50.6	54.8	12(1.8)	5(.7)	55(8.1)	6(.9)	4(.6)	259(38.1
Michigan	635 (100)	465	73.2	77.5	11(1.7)	49(7.7)	30(4.7)	5(.8)	5(.8)	70(11.)
Puerto Rico	490 (100)	288	58.9	61.9	34(6.9)	12(2.5)	4(.8)	21(4.3)	3(.6)	128(26.1
Iowa	470 (100)	327	69.6	70.6	2(.4)	2(.4)	6(1.3)	1(.2)	5(1.)	127(27.)
California	524	370	70.6	79.5	4(.8)	6(1.2)	42(8.)	17(3.2)	3(.6)	82(15.7
Ohio	555	394	71.1	75.2	18(3.2)	36(6.5)	15(2.7)	15(2.7)	7(1.3)	70(12.6

Row Percentages in Brackets

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems

TABLE 5
Type Condition And The Percent Of The State And Nine State Totals.

ondition	Nine States		TX		PA		GA		TN		MI		PR		IO		OH		CA	
OTAL	5125		446		803		522		680		635		490		470		555		524	
ENTAL	1610	31.4	-*	-	243	30.3	179	34.3	366	53.8	240	37.8	107	21.8	130	27.7	244	42.4	121	23.1
ISION	795	15.5	108	24.2	154	19.2	89	17.1	154	22.6	101	15.9	27	5.5	49	10.4	86	15	27	5.2
EARING	190	3.7	27	6.1	50	6.2	8	1.5	10	1.5	34	5.4	8	1.6	6	1.3	26	4.5	21	4
EMATOCRIT	269	5.3	12	2.7	9	1.1	73	14	30	4.4	12	1.9	20	4.1	6	1.3	61	10.6	46	8.8
THER	2261.	44.1	299	67.	347	43.2	173	33.1	120	17.7	248	39.1	328	66.9	279	59.4	158	27.5	309	59

*Dental conditions were not surveyed in Texas.

ANNEX B

REPORT OF THE TEXAS SURVEY

TEXAS

Responsible agency: The Department of Public Welfare.

Screening agency: The Department of Public Health, under contract to the Department of Public Welfare, operates the screening clinics.

Treatment agency/location: Private practitioners, public and private clinics.

Medical follow-up system: The client is informed of need for care, the client is assisted with making appointment.

Case monitoring, follow-up: A referral form is sent with the client to the provider. The provider completes the referral form indicating his diagnosis and the treatment rendered and returns the form to the Public Welfare office responsible for the patients records. When this is not done the worker responsible for the client's records telephones the client and/or provider to determine if treatment was received/given. A letter or visit is substituted as required. To the extent resources are available, and the client indicates need, transportation is provided to and from treatment and a worker accompanies the client and assists him/her throughout the appointment.

Data system: At the time of the survey was limited to Title XIX payment processing. Case monitoring data management was limited to local site receipt of referral forms back from the providers and to local site developed "signaling" of records to facilitate follow-up by telephone, letter, or visit.

Current activities: Revised referral forms with attached return addressed, franked envelopes have been instituted. These are integrated into a computerized case monitoring system with periodic printouts of unresolved cases provided to local sites for follow-up.

Dental: Generally, dental screening is not performed during the EPSDT examination. The title XIX dental program is separate from EPSDT in this state. Therefore the figures reported for Texas do not include a dental component except for in two cases wherein the orthodontal problems of the children were picked up in the course of ordinary physical inspection.

Site Comments:

San Antonio: Two sites were surveyed. 68 forms were completed. 12 screening records could not be found. All forms were verified for accuracy by HSRI. At the time of the survey clients' cases records were sometimes from district to district in order to insure full utilization of welfare workers' time. Inevitably this led to the loss of some case records and to poor follow-up continuity. Workers noted that clients with conditions that could be treated in one visit were generally treated, but that clients with conditions that require more than one visit rarely arrive at the second or multiple appointments. Thus chronic conditions are often not treated to the logical completion of treatment.

Beaumont: Two sites were surveyed, one in Beaumont and one in Port Arthur. 80 forms were completed. All were verified for accuracy by HSRI. The records in Port Arthur were excellent. Outreach and counseling communications developed by the Port Arthur Welfare office staff were models of effectiveness and clarity.

Lubbock: Two sites were surveyed, one in Lubbock and one in Plainview. 67 forms were completed. 3 children were not referred. 10 screening records could not be found. All forms were verified for accuracy by HSRI.

Eagle Pass: Two sites were surveyed, one in Eagle Pass and one in Carrizo Springs. 79 forms were completed. 1 child was not referred. All forms were verified for accuracy in Carrizo Springs and 20% were verified in Eagle Pass by HSRI. Programs in both sites were exceptionally well run. The case workers in both sites knew all of their clients personnally. The case worker in Carrizo Springs was on a first name basis with all of his clients and knew the status of their cases without having to refer to records. This extraordinarily effective individual is a model of the indigenous welfare worker. The success of these programs is especially to be praised whereas they are working with poor, seasonally migrant farm laborers in the poorest area of the country. The nearest optician is over sixty miles away and the nearest major care facilities over 120.

Ft. Worth: 74 forms were completed, 6 records could not be found. 20% of the forms were verified for accuracy by HSRI. This site makes appointments with the clients parent/guardian for transportation by van. A social worker accompanies the van to encourage or help the client off to the referred treatment. Short of educating the client to desire treatment this is probably the most effective means to get clients to treatment, especially the chronic appointment failures, seen during this survey.

TABLE 1
Problems Found At Screening, Treated and Other Disposition, By Major Problem Category for the State of

TEXAS

Major Screening Category	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
TOTAL	448	309	69	74.1	3	18	28	3	26	61
DENTAL	2	1	50	50		1				
VISION	108	73	67.6	75.3		5	11		5	14
HEARING	27	22	81.5	84.6			1			4
HEMATOCRIT	12	10	83.3	90.9				1		1
OTHER	299	203	67.9	72.2	3	12	16	2	21	42

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 1A
Problems Found At Screening, Treated and Other Disposition, By Major Problem Category for the Site of:

San Antonio

Major Screening Category	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
TOTAL	81	47	58	69.1		3	12	1	4	14
DENTAL	0		-	-						
VISION	21	12	57.1	70.6		1	4		1	3
HEARING	5	4	80	80						1
HEMATOCRIT	1		0					1		
OTHER	54	31	57.4	67.4		2	8		3	10

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening"

TABLE 1B
Problems Found At Screening, Treated and Other Disposition, By Major Problem Category for the Site of:

Beaumont

Major Screening Category	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
TOTAL	94	53	56.4	62.4	1	4	4	5	5	22
DENTAL	1	1	100	100						
VISION	30	21	70	84		1		5		3
HEARING	12	9	75	81.8			1			2
HEMATOCRIT	1	1	100	100						
OTHER	50	21	42	44.7	1	3	3		5	17

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 1C

Problems Found At Screening, Treated and Other Disposition, By Major Problem Category for the Site of:

Lubbock

Major Screening Category	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
TOTAL	93	63	67.7	70		2	2	1	8	17
DENTAL	0		-	-						
VISION	23	14	60.9	63.6		1	1		2	5
HEARING	5	4	80	80						1
HEMATOCRIT	0		-	-						
OTHER	65	45	69.2	71.4		1	1	1	6	11

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 1D
Problems Found At Screening, Treated and Other Disposition,
By Major Problem Category for the Site of:

Eagle Pass

ajor creening ategory	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
OTAL	94	82	87.2	88.2	2	4	1		5	
ENTAL	1		-	-		1				
ISION	15	13	86.7	86.7		1			1	
EARING	1	1	100	100						
EMATOCRIT	0		-	-						
THER	77	68	88.3	89.5	2	2	1		4	

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 1E
Problems Found At Screening, Treated and Other Disposition, By Major Problem Category for the Site of:

Ft. Worth

Major Screening Category	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
TOTAL	86	64	74.4	79		5	4	1	4	8
DENTAL	0		-	-						
VISION	19	13	68.4	72.2		1	1		1	3
HEARING	4	4	100	100						
HEMATOCRIT	10	9	90	90						1
OTHER	53	38	71.7	77.5		4	3	1	3	4

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 2
Total Of Problems (All Categories) Found At Screening, Treated And Other Dispositions, By Site

TEXAS

Site	Number Of Problems Found At Screening	Number Treated	Percent Treated	Adjusted Percent Treated*	On Waiting List	Repeated Appointment Failures	Refused Treatment	Problem No Longer Apparent	No Longer Eligible	Other No Show
San Antonio	81	47	58	69.1		3	12	1	4	14
Beaumont	94	53	56.4	62.4	1	4	4	5	5	22
Lubbock	93	63	67.7	70		2	2	1	8	17
Eagle Pass	94	82	87.2	88.2	2	4	1		5	
Ft. Worth	86	64	74.4	79		5	4	1	4	8

*Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

TABLE 3
Problems Found At Screening, Percent Treated
(Raw And Adjusted), By Major Problem Category.

TEXAS

	Overall Total			San Antonio			Beaumont			Lubbuck			Eagle Pass			Ft. Worth								
	Np	%t	%ta	Np	%t	%ta	Np	%t	%ta	Np	%t	%ta	Np	%t	%ta	Np	%t	%ta	Np	t	ta	Np	t	ta
TOTAL	448	69	74.1	81	58	69.1	94	56.4	62.4	93	67.7	70	94	87.2	88.2	86	74.4	79						
DENTAL	2	50	50	0	-	-	1	100	100	0	-	-	1	-	-	0	-	-						
VISION	108	67.6	75.3	21	57.1	70.6	30	70	84	23	60.9	63.6	15	86.7	86.7	19	68.4	72.2						
HEARING	27	81.5	84.6	5	80	80	12	75	81.8	5	80	80	1	100	100	4	100	100						
HEMATOCRIT	12	83.3	90.9	1	0	0	1	100	100	0	-	-	0	-	-	10	90	90						
OTHER	299	67.9	72.2	54	57.4	67.4	50	42	44.7	65	69.2	71.4	77	88.3	89.5	53	71.7	77.5						
NUMBER OF CHILDREN	368			68			80			67			79			74								
NUMBER OF PROBLEMS PER CHILD	1.22			1.19			1.18			1.39			1.19			1.16								

1: Number of problems found at screening.
2: Percent of problems treated.
3: Percentage of problems treated after the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number Of Problems Found At Screening".

ANNEX K

SUPPLEMENTAL INFORMATION

Problems Found at Screening, Treated and Other Dispositions, by Multiple Problem Category, for Nine States

Range of Problems (ICDA Codes)	Percent of Total Problems (Base = 5056)*	Adj. Number of Problems** (Problems Treated)	Adjusted Percent Treated
Dental Problems	32.3%	1488 (917)	61.6%
Vision Problems	15.9%	748 (566)	75.7%
Hearing Problems	3.8%	166 (124)	74.7%
Hematocrit Problems	5.4%	256 (211)	82.4%
Other Problems (Total)	42.5%	2126 (1614)	75.9%
Other problems by category:			
Respiratory System (460-519)	7.0%	352 (304)	86.4%
Other (760-999)	5.1%	256 (190)	74.2%
Musculoskeletal (710-738)	3.7%	188 (133)	70.7%
Nutritional Deficiencies (240-279)	3.6%	182 (132)	72.5%
Nervous System and Sense Organs (320-389)	3.5%	176 (138)	78.4%
Skin (680-709)	3.0%	156 (132)	84.6%
Heart (390-458)	3.0%	149 (110)	73.8%
Genito Urinary (580-629)	2.9%	148 (101)	68.2%
Mental Disorders (290-315)	2.5%	126 (73)	57.9%
Blood Diseases (280-289)	2.0%	100 (79)	79.0%
Infective Diseases (001-136)	1.3%	68 (60)	88.2%
Digestive System (510-577)	1.3%	64 (49)	76.6%
Birth Defects (740-759)	1.0%	50 (37)	74.0%
Pregnancy - Birth Prob. (630-679) (760-799)	.4%	23 (18)	78.2%
Cancer (137-239)	.4%	20 (16)	80.0%

* note: this base is smaller than the 5127 used in the report. This is due to 71 cases of "other" which remained unclassified.

**After the deletion of "Refused Treatment" and "Problems No Longer Apparent" categories from the "Number of Problems Found At Screening".

Number and Percent Showing for Treatment
(one and more problems)

Number of Problems Found		Number of Shows for Treatment						Percent of All Problems in Category	Percent of All Children in Category	Percent of Children With All Problems Treated
		0	1	2	3	4	5			
	1	545 (26 %)	1521 (74%)					43%	64%	74%
	2	141 (16%)	231 (27%)	496 (57%)				36%	27%	57%
	3	24 (10%)	38 (15%)	63 (25%)	123 (50%)			16%	8%	50%
	4	5	5	8	13	12		3%	1%	28%
	5	1	1	1	0	5	3	1%	1%	27%
	6	0	0	0	0	1	1	1%	1%	0%
	7									
	8									

APPENDIX B

State Survey Form

STATE SURVEY FORM

Health Services Research Institute
The University of Texas
Health Science Center
San Antonio, Texas

1 S
1

HSRI Use
3

Child's Name: ______________________

Parent/Guardian: ______________________

Date of Screen
6

Medicaid Case #(left justify)

Site

27 Site Code

Recipient Identification Number

TO BE COMPLETED BY ON-SITE WORKER

28 Date of Birth

34 Sex 1=Male 2=Female

35 Today's Date

Was Screen: 41 1=Original 2=Periodic

Immunization Needed? 42 1=Yes 2=No

If Yes, Which? DPT 43 MMR 44 OPV 45

Immunization Given? 46 1=Yes, at Site 2=No 3=Yes, Later

If Yes, Which? 47 48 49

SECTION 2

2 / / / /
1 Dupe

	DENTAL	VISION	HEARING	HEMATOCRIT	OTHER 1	OTHER 2	OTHER 3	OTHER 4
1 Problems Found — Enter 1 In The Column(s) For Which Child Had A Problem	6							

OTHER(list):
1. ______________________
2. ______________________
3. ______________________
4. ______________________

HSRI ONLY
14
17
20

[Enter A Code In Each Column That Has An Entry Above]

2. Problem Retested?
1=No
2=Yes, Confirmed
3=Yes, Not Confirmed

	D	V	H	H	1	2	3	4
	23							30

3. Where Treatment Referred:
1=Screen Site Treatment Same Day
2=General Practitioner (incl. Pediatrician)
3=Specialist (ie- Internist, Ophthalmologist)
4=Dentist
5=Other (ie-Optometrist, County Clinic)

	D	V	H	H	1	2	3	4
	31							38

4. Show For Diagnosis Or Treatment?
1=Yes
2=No, On Waiting List
3=No, Repeated Appt. Failures
4=No, Refused
5=No, Problem No Longer Apparent
6=No, No Longer Eligible
7=No, Other ______________
(Specify)

	D	V	H	H	1	2	3	4
	39							46

5. If "Yes" On Question #4 , Indicate # Of Days Between Referral and Treatment

D	V	H	H	1	2	3	4

47 70

6. Current Problem Status:

D	V	H	H	1	2	3	4

71 78

Resolved
1=Treatment Completed First Visit
2=Treatment Completed Subsequent Visit
3=Treatment Not Advisible Or Warranted

Unresolved
4=Still Under Treatment
5=Treatment Not Available Or Authorized
6=On Waiting List

Administrative Termination
7=Moved
8=Lost Eligibility
9=Repeated Appt. Failures
A=Refused Treatment
B=Other, ____________
(Specify)

---

3 / / / /
1 Dupe

7. Shows For Treatment:
Source Of Information
(Place 1 In All Applicable Boxes)

		D	V	H	H	1	2	3	4
A. Medical Payment Claims	6								
B. Agency Case Record	14								
C. Screening Record	22								
D. Contact Of Parent	30								
E. Contact Of Treatment Source	38								

45

THE REMAINDER OF THE FORM IS TO BE COMPLETED BY HSRI STAFF ONLY

8. Medicaid $:
12 Mos. Before Screen

Dental	Vision	Hearing	Hematocrit
46	50	54	58

Other 1	Other 2	Other 3	Total
62	66	70	74 77

---

4 / / / /
Dupe

9. 4 Mos. After Screen
(specific problem)

Dental	Vision	Hearing	Hematocrit

Other 1	Other 2	Other 3	Total

APPENDIX C

Medicaid Cost Analysis of 5 States

MEDICAID COST ANALYSIS OF 5 STATES

Site

1 State Code | HSRI ID

Last, First
Child's Name

Medicaid Number

Michigan Recipient Number

Date of Screen

Age At Screen

5 Infants — Age in Months (0-<24)

7 Children — Age in Years (2-21)

9 Before Screen

10 After Screen

Medicaid Cost Data Available

1 = Yes
2 = None
3 = Incomplete

Data Range BEFORE Screen

Date Begun

Days Covered	State		Child	Days Covered
		1974		
		1975		
		1976		

Date First Claim Before Screen

= 1+ ÷ 30.4 | ÷ 30.4 + 1 =

Months 11 (Max 12) | 1 (Max 12) Months

Data Range AFTER Screen

Date Stopped

Days Covered	State		Child	Days Covered
		1975		
		1976		
		1977		

Date Last Claim After Screen

= 1+ ÷ 30.4 | ÷ 30.4 + 1 =

Months 15 (Max 12) | 17 (Max 12) Months

19 Before | 20 After
Eligibility

1 = Unknown
2 = Some Ineligibility
3 = Eligibility Accurate

21 Were There Any Costs Prior to One Year Before the Screen?

1 = Yes
2 = No

22 Hospital Days BEFORE Screen

25 Hospital Days AFTER Screen

28 Total Charged Before Screen

33 Total Charged After Screen

38 Total Paid Before

43 Total Paid After Screen

48 # Problems With $500 + Cost

49 # Problems Omitted from Study

Not Screened = 0
Related

TYPE		Costs (BEFORE)	Screen	Costs (AFTER)
1	→		P	----------$
2	→		P	
3	→	$---------	P	
4	→	$---------	P	----------$

50 Cost of Screen

	DENTAL	VISION	HEARING	HEMATOCRIT	OTHER 1	OTHER 2	OTHER 3	OTHER 4	IMMUNIZATION
	Type 53	Type 54	Type 55	Type 56	Type 57	Type 58	Type 59	Type 60	Type 61
Not Screen Related	62	66	→						70
Cost Before Screen	72 visits	75 visits	→						78 visits
Screen Related	80	84	88	92	96	101	106	110	114
Costs Before Screen	116 visits	119 visits	122 visits	125 visits	128 visits	131 visits	134 visits	137 visits	140 visits
Screen Related	142	146	150	154	158	163	168	172	176
Costs After Screen	178 visits *181	182 visits *185	186 visits *189	190 visits *193	194 visits *197	198 visits *201	202 visits *205	206 visits *209	210 visits *212
Not Screen Related	213	217	→						221
Costs After Screen	223 visits	226 visits	→						229 visits

*Was there treatment within 4 months of Screening?

9 State information compared to claim information

Code	9 state Survey	Claim Information
1	Agree	Agree
2	Said Treatment	None
3	Said No Treatment	Present

Total Medication Costs

231 Before Screen

235 After Screen 238

APPENDIX D

ICDA Diagnoses by ICDA Code Groupings For Other Screen-Related Problems

APPENDIX D

ICDA Diagnoses by ICDA Code Groupings
For Other Screen-Related Problems

1) INFECTIVE DISEASES 001-136

	ICDA	N
Diarrheal disease	009	1
Failed Tine test	011	9
Strep-sore throat and scarlet fever	034	2
Other bacterial diseases	039	1
Mumps	072	1
Infectious Mononucleosis	075	2
Other viral diseases	079	3
Congenital syphilis	090	1
Early syphilis, latent	092	1
Gonococcal infections	098	1
Dermatophytosis	110	2
Dermatomycosis, other unspecified	111	1
Moniliasis	112	1
Other intestinal helminthiasis	127	2
Pediculosis	132	4
Acariasis	133	5
		37

2) CANCER 140-209

		0

3) BENIGN & UNSPECIFIED NEOPLASMS 210-239

Benign neoplasm of buccal cavity	210	1
Other of muscular and connective tissue	215	1
Benign neoplasm of skin	216	1
Other benign neoplasm	228	1
Benign neoplasm of breast	233	3
Other benign neoplasm	239	1
		8

4) NUTRITIONAL DEFICIENCIES 240-279

Other disorders of thyroid gland	246	1
Diabetes mellitus	250	1
Other nutritional deficiencies	269	19
Amyloidosis	276	1
Obesity, not specified as endocrine	277	38
		60

5) BLOOD DISEASES 280-289

Iron deficiency anemias	280	13
Other deficiency anemias	281	1
Hereditary hemolytic anemias	282	26
Other unspecified anemias	285	3
Agranulocytosis	288	1
Other disorders of blood and blood forming organs	289	4
		48

6) MENTAL DISORDERS 290-315

Neuroses	300	2
Special symptoms not elsewhere classified	306	16
Transient situational disturbances	307	1
Behavior disorders of childhood	308	17
Mental disorder not specified as psychotic associated with physical condition	309	1
Borderline Mental Retardation	310	1
Severe Mental Retardation	313	2
Unspecified Mental Retardation	315	2
		42

7) NERVOUS SYSTEM 320-358

Other cerebral paralysis	344	1
Migraine	346	1
Other disorders of peripheral autonomic nervous system	357	1
		3

8) VISION 360-379

Conjunctivitis and ophthalmia	360	5
Blepharitis	361	1
Refractive errors	370	3
Corneal opacity	371	7
Strabismus	373	6
Detachment of retina	376	1
Other disorders of retina and optic nerve	377	1
Other disorders of eye	378	1
		25

9) HEARING 380-389

Otitis externa	380	11
Otitis media without mastoiditis	381	37
Other inflammatory disorders of the ear	384	18
Other disorders of ear and mastoid process	387	14
Deaf mutism	388	1
Other deafness	389	1
		82

10) HEART 390-458

Malignant hypertension	400	1
Essential benign hypertension	401	5
Hypertensive heart and renal disease	404	1
Chronic ischemic heart disorder	412	2
Chronic disorder of endocardium	424	6
Pulmonary heart disease	426	1
Symptomatic heart disease	427	51
Ill-defined heart disease	429	3
Other disorders of circulatory system	458	9
		79

11) RESPIRATORY 460-462, 464-499, 501-519

Acute nasopharyngitis (common cold)	460	18
Acute pharyngitis	462	16
Acute URI of multiple or unspecified sites	465	32
Acute bronchitis and bronchiolitis	466	1
Bronchitis, unqualified	490	11
Asthma	493	5
Chronic pharyngitis and nasopharyngitis	502	4
Chronic sinusitis	503	3
Nasal polyp	505	1
Hay fever	507	5
Other disorders of URI	508	7
Pulmonary congestion and hypostasis	514	1
Other disorders of respiratory system	519	4
		108

12) DIGESTIVE 520-577

Gastritis and duodenitis	535	2
Inguinal hernia without obstruction	550	1
Other hernia of abdominal cavity without obstruction	551	3

Digestive - cont.

Inguinal hernia without obstruction	552	5
Other hernia without obstruction	553	3
Functional disorders	564	1
		15

13) GENITO URINARY 580-629

Anal fissure and fistula	565	1
Other disorders of intestines and peritoneum	569	1
Infections of kidney	590	1
Cystitis	595	2
Urethritis (nonvenereal)	597	1
Stricture of urethra	598	1
Other disorders of urinary tract	599	17
Hydrocele	603	1
Redundant prepuce and phimosis	605	18
Other disorder of male genital organs	607	4
Chronic cystic disorder of breast	610	2
Other disorders of breast	611	1
Infective disorder of uterus, vagina, vulva	622	16
Disorders of menstruation	626	2
Other disorder of female genital organs	629	4
		73

14) PREGNANCY AND BIRTH PROBLEMS 630-679, 760-779

Other complications of pregnancy	634	1
Hemolytic disorder of newborn without kernicterus	775	2
		3

15) SKIN 680-709

Other cellulitis and abscess	682	1
Impetigo	684	1
Seborrheic dermatitis	690	2
Infantile eczema and related conditions	691	1
Other eczema and dermatitis	692	44
Disorder of hair and hair follicles	704	1
Disorder of sebaceous glands	706	5
Other disorder of skin	709	3
		58

16) MUSCULOSKELETAL 710-738

Acute arthritis due to pyogenic organisms	710	3
Osteomyelitis and periostitis	720	1
Vertebrogenic pain syndrome	728	1
Other disorder of joint	729	2
Other disorder of muscle, tendon, fascia	733	3
Curvature of the spine	735	12
Flat feet	736	2
Other deformities or pains	738	52
		76

17) BIRTH DEFECTS 740-759

Anencephalus	740	1
Congenital anomalies of nervous system	743	1
Congenital anomalies of ear, face, neck	745	1
Congenital anomalies of heart	746	4
Cleft palate and cleft lip	749	1
Congenital anomalies of genital organs	752	5
Clubfoot	754	2
Other congenital anomalies of limbs	755	2
Other congenital anomalies of musculoskeletal system	756	2
Congenital anomalies of skin, hair,nails	757	3
Other and unspecified congenital anomalies	758	1
		23

18) OTHER 780-999

Certain symptoms referred to nervous system and specified senses	780	8
Symptoms referred to cardiovascular and lymphatic system	782	1
Symptoms referred to respiratory system	783	1
Symptoms referred to upper gastro-intestinal tract	784	1
Symptoms referred to abdomen and lower gastrointestinal tract	785	5
Symptoms referred to genitourinary system	786	17
Symptoms referred to limbs and joints	787	1
Other general symptoms	788	6
Abnormal urinary constituents	789	14
Uremia	792	1
Other ill-defined and unknown causes of morbidity and mortality	796	44
Fracture of clavicle	810	1

Other - cont.

Dislocation of hip	835	1
Sprains and strains of hip and thigh	843	1
Open wound of eye and orbit	870	1
Open wound of finger	883	1
Open wound of foot, except toes alone	892	2
Superficial injury of face, neck, scalp	910	2
Superficial injury of trunk	911	1
Contusion of elbow, forearm, and wrist	924	1
Foreign body in eye and adnexa	930	1
Foreign body in ear	931	3
Toxic effect of corrosive aromatics, acids, alkalis	983	1
Toxic effect of lead and its compounds	984	4
		119

19) TONSILLITIS 463-500

Acute tonsillitis	463	33
Hypertrophy of tonsils and adenoids	500	9
		42

APPENDIX E

Individual Costs for Children with Conditions Costing More than $500

KEY

STATE:

1 = Texas
4 = Tennessee
5 = Michigan
7 = Iowa
9 = California

SITE:

Texas

015 = San Antonio
123 = Beaumont
152 = Lubbock (Rural)
159 = Eagle Pass (Rural)
220 = Fort Worth

Tennessee

401 = McNairy County (Rural)
402 = Hardin County (Rural)
404 = Washington (Rural)
405 = Knoxville
406 = Nashville
407 = Memphis

Michigan

501 = Grand Haven (Rural)
502 = Flint
503 = Grand Rapids
504 = Allegan (Rural)
505 = Detroit

Iowa

721 = Clay (Rural)
749 = Maquoketa (Rural)
757 = Cedar Rapids
778 = Council Bluffs
782 = Davenport
790 = Ottumwa (Rural)

California

901 = Los Angeles
902 = Contra Costa*
903 = San Bernadino
904 = Sonoma (Rural)
905 = Ventura

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*Treated as a separate state in the report

TCB = Condition's Total Cost Before
TCA = Condition's Total Cost After
HCB = Hospital Cost Before
HCA = Hospital Cost After
OCB = Outpatient Cost Before
OCA = Outpatient Cost After
O/P = Original or Periodic Screen
    1 = Original
    2 = Periodic
    3 = Unknown
D = Discovery Point, First Costs
    1 = Before Screen
    2 = Screen-Related Problem
    3 = After Screen
DG = Diagnostic Group (if any) for High Cost Problems
    1 = Dental
    2 = Otitis
    3 = Colitis
    4 = Heart
    5 = Vision
    6 = Mental and Emotional
    7 = Delivery
    8 = Genitourinary
    9 = Accidents and Injury
    10 = Hernia and Hydrocele
    11 = Tonsillitis
    12 = Pneumonia, Bronchitis, etc.
HB = Number of Hospitalizations Before
HA = Number of Hospitalizations After
HDB = Hospital Days Before
HDA = Hospital Days After
OVB = Outpatient Visits Before
OVA = Outpatient Visits After

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FIVE STATE MEDICAID COST ANALYSIS
FIVE HUNDRED DOLLAR PLUS PROBLEMS

State/Site	TCB	TCA	HCB	HCA	OCB	OCA	Diagnosis	AGE	O/P	D	DG	HB	HA	HDB	HDA	OVB	OVA
1220		1274		1241		33	DIARRHEA AND FAILURE	0.1	1	2			1		11		1
9903		5613		5533		80	MENINGITIS	0.1	2	3			2		31		1
9903	630		630				NUTRITIONAL DEFICIENC	0.2	2	1		1		3			
7782		954		954			VIRAL INFECTION	0.5	2	3			1		6		
7778	2002		1780		222		ALLERGIES	0.4	1	1		3		17		6	
7778	546		546				ECZEMA	0.4	1	1		1		6			
1159	4311		4272		39		CEREBERAL PROBLEMS	0.8	1	1		1		21		3	
1159	703		703				OTHER ILL-DEFINED CON	0.8	1	1		1		1			
1159	4415		4415				HOSPITAL STAY WITHOUT	0.8	1	1		1		13			
7782		830		830			CELLULITIS OF LEG	3	2	3			1		8		
9902		537		421		116	ADENOIDITIS	1	1	2			1		2		2
9902		1207		1114		93	ADVERSE EFFECT OF DRU	1	1	3			1		2		1
7778	580		418		162		DENTAL	2	1	1	1	1				3	
4405		534				534	DENTAL	4	2	2	1						4
4405	130	808	123	774	7	34	OTITIS MEDIA	4	1	1	2	1	1	1	2	1	4
7778	986	8	904		82	8	COLITIS	0.4	1	1	3	2		9		4	1
7757	648		648				COLITIS	2	1	1	3	1		7			
7782	938		938				COLITIS	2	1	1	3	1		9			
7757	3447	8	3447			8	COLITIS	4	1	1	3	1		28			1
9903	1530	13	1487		43	13	PURPURA	0.5	2	1	5	1		8		3	2
7782	601	8	571		30	8	STRABISMUS	2	1	2	5	1		2		3	1
7757	630		613		17		HYPOSADIES		3	1	8	1		4		1	
7778	125		125				HYPOSPADIES	2	1	1	8	1		3			
7757		579		502		77	URETHRA	4	3	3	8		1		2		6
7757		521		486		35	URETHRA	4	1	3	8		1		2		1
1220	4789		4755		34		BURN	1	1	1	9	1		22		2	

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FIVE- STATE MEDICAID COST ANALYSIS
FIVE HUNDRED DOLLAR PLUS PROBLEMS

State/Site	TCB	TCA	HCB	HCA	OCB	OCA	Diagnosis	AGE	O/P	D	DG	HB	HA	HDB	HDA	OVB	OVA
7782	1058	30			1058	30	DISLOCATED HIP	2	1	2	9					19	3
9903		1130		857		273	HERNIA	0.3	1	2	10		1		7		2
9902	621		562		54		HERNIA	0.8	2	1	10	2		2		2	
9903		1419		1419			HERNIA	1	2	2	10		1		7		
1152		537		529		8	HYDROCELE	2	2	3	10		1		2		1
1015		603		589		14	HERNIA	3	1	2	10		1		2		2
7782		785		765		20	HERNIA	3	1	3	10		1		3		1
1015		546		546			TONSILLITIS	3	1	3	11		1		2		
1015		730		693		37	TONSILLITIS	3	1	2	11		2		3		3
7757	633		633				TONSILLITIS	4	1	1	11	1		2			
4405		863		829		34	PHARYNGITIS		1	3	12		1		7		2
9903		1886		1831		54	PNEUMONIA	0.1	1	3	12		1		11		7
1123		615		596		19	DISEASE OF RESPIRATOR	0.2	1	3	12		1		3		2
9903		829		798		31	PNEUMONIA	0.3	1	3	12		1		8		2
9903	875		863		12		PNEUMONIA	0.3	1	1	12	1		5		2	
7782	2255		2216		49		BRONCHITIS	0.7	1	1	12	2		19		4	
7782	1224	6	1123		101	6	BRONCHITIS	0.8	1	1	12	1		9		6	1
1220	83	672		637	83	35	PNEUMONIA AND BRONCHI	1	1	1	12		1		5	11	3
7757	722	23	700		22	23	BRONCHITIS	1	2	1	12	1		8		3	3
7782	44	632		632	44		PNEUMONIA	1	1	2	12		1		5	2	
9902	803		803				BRONCHITIS	1	1	1	12	1		4			
9902	676		649		27		PNEUMONIA	1	1	1	12	1		4		2	
7778	1892	1451	1788	1364	104	87	PNEUMONIA	2	1	1	12	2	2	15	11	6	2
7778		718		684		34	LARYNGITIS	2	1	3	12		1		5		2
7782	783	6	681		102	6	BRONCHITIS	2	1	2	12	2		9		2	1
1220		2307		2284		23	POLYNEURITIS	5	2	3			1		19		2

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FIVE STATE MEDICAID COST ANALYSIS
FIVE HUNDRED DOLLAR PLUS PROBLEMS

State/Site	TCB	TCA	HCB	HCA	OCB	OCA	Diagnosis	AGE	O/P	D	DG	HB	HA	HDB	HDA	OVB	OVA
1015		771		738		53	CELLULITIS	7	2	3			1		4		5
4407		637		537			DIS. OF CENTRAL NERVO	7	2	3			1		3		
9905		1427		1240		137	RIGHT ARM PARALYSIS-P	8	1	2			1		3		8
1123		646		632		14	ECZEMA AND DERMATITIS	9	1	3			1		10		1
7757		1058		1058			LEG PAIN	9	2	2			1		9		
7782		1005		1005			VIRAL INFECTION	9	1	3			1		11		
7778		754		754			ADVERSE EFFECT OF SED	10	1	3			1		4		
1123		522		512		10	ABDOMINAL PAIN	11	1	3			1		3		1
1152		771		732		39	ABDOMINAL PAIN	11	2	2			1		4		4
7782	908				908		ARTIFICIAL LEG	11	2	1						1	
9901	807			731		76	APPENDICITIS	12	1	3			1		5		2
4406	10	911	870		10	41	OTITIS MEDIA	7	1	1	2		1	2		1	5
7721	1342		1236		106		ENDOCARDIUM	5	2	1	4	1		3		1	
1123		617		593		24	DISORDER OF HEART RHY	8	2	2	4		1		13		2
7757		653		542		111	HEART	9	2	3	4		1		3		1
4405		559		477		82	CARDIOVASCULAR/LYMPHA	12	1	3	4		1		4		4
4406	10	875			10	875	TRANS. SITUATIONAL DI	5	2	1	6					2	27
4406		1295				1295	TRANS. SITUATIONAL DI	6	2	3	6						37
4406	735	455			735	455	PSYCHOSOMATIC ILLNESS	7	1	1	6					21	13
7782	205	388			205	388	NEUROSIS	10	2	2	6					6	14
4404	202	315			202	315	MILD MENTAL RETARDATI	11	1	1	6					9	14
7757		562		543		19	URINARY	5	1	2	8		1		2		1
4405		1053		1053			UNDESCENDED TESTICLE	8	2	2	8		1		5		
4404		531		519		12	DISEASE OF URINARY TR	10	1	3	8		1		4		1
7757	1559		1537		22		BROKEN FEMUR	5	2	1	9	1		16		2	
1123		523		499		24	[illegible]	10	1	3	9		1		3		1

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FIVE STATE MEDICAID COST ANALYSIS
FIVE HUNDRED DOLLAR PLUS PROBLEMS

State/Site	TCB	TCA	HCB	HCA	OCB	OCA	Diagnosis	AGE	O/P	D	DG	HB	HA	HDB	HDA	OVB	OVA
7782	547		437		60		FRACTURED ARM	11	2	1	9	1		4		2	
7757		620		620			HERNIA	5	1	2	10		1		2		
9902		2035		1927		108	HERNIA	7	2	2	10		2		6		5
1220		888		878		10	INGUINAL HERNIA	11	2	3	10		1		5		1
9901		650		595		55	TONSILLITIS	5	1	2	11		1		2		3
1220		667		625		42	TONSILLITIS	6	2	3	11		1		3		2
9905	48	508		508	48		TONSILLITIS	7	1	1	11		1		2	1	
9902		552		532		20	TONSILLITIS	7	1	3	11		1		2		1
1015	31	579		563	31	11	TONSILLITIS	8	1	1	11		1		2	1	1
1015	549		540		9		TONSILLITIS	8	3	1	11	1		2		1	
1123	713		614		99		TONSILLITIS	8	2	1	11	1		3		6	
1220		599		557		42	TONSILLITIS	9	2	3	11		1		2		2
1015		703		687		16	TONSILLITIS	10	1	2	11		1		3		2
1123	18	593		579	18	14	TONSILLITIS	10	1	1	11		1		3	1	1
1123		713		600		113	TONSILLITIS	11	1	3	11		1		2		6
1220		613		587		26	TONSILLITIS	11	2	2	11		1		2		3
7778	296	230			296	230	HAY FEVER	5	1	1	12					34	24
7757	583		563		20		BRONCHITIS	5	1	1	12	1		6		1	
9902	470	102	457		12	102	PHARYNGITIS	10	1	1	12	1		3		1	6
1015	5276	1417	4960	1168	316	249	ASTHMA AND BRONCHITIS	11	1	1	12	2	2	22	10	16	11
1159		515		515			CONVULTIONS	15	1	3			1		3		
1123	613	15	778		55	15	CEPHALGIA AND HEADACH	17	2	1		2		22		5	1
1220		957		947		10	ENLARGEMENT OF LYMPH	17	1	3			2		14		1
4405		534		534			UNSPECIFIED HOSPITALI	18	1	3			1		4		
9903		894		784		112	BREAST NEOPLASM	19	1	2			1		2		2
4406	834		805		29		BREAST NEOPLASM	20	1	1		1		4		1	

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FIVE STATE MEDICAID COST ANALYSIS
FIVE HUNDRED DOLLAR PLUS PROBLEMS

State/Site	ICB	TCA	HCB	HCA	OCB	OCA	Diagnosis	AGE	O/P	D	DG	HB	HA	HDB	HDA	OVB	OVA
4405		192				192	DENTAL	19	1	2	1						4
7711	1360	30	1224		1136	30	OTITIS	16	2	1	2	1		3		2	
9905		745		622		123	CATARACTS	13	1	3	5		1		2		3
1220		1074		991		83	CATARACTS	16	1	2	5		1		2		2
1123	1294		1261		33		DISEASE OF THE IRIS C	17	1	1	5	1		10		2	
7782	1392	1737	1280	1737	112		MENTAL DISORDER	15	2	2	6	1	1	18	16	5	
1015		908		878		30	NEUROSIS	18	1	2	6		1		8		1
1220	733		721		12		DELIVERY WITHOUT COMP	15	1	1	7	1		2		1	
9904	515		515				DELIVERY	16	1	1	7	1		2			
1015	66	557	66	526		31	DELIVERY WITHOUT COMP	17	1	1	7	1	1	1	2		1
7782	576		576				DELIVERY	17	3	1	7	1		5			
1015	869		790		79		DELIVERY	18	1	1	7	1		3		2	
4406		548		548			DELIVERY	18	1	3	7		1		2		
1220	599		599				DELIVERY WITHOUT COMP	20	1	1	7	1		2			
4404		510		510			DELIVERY	20	1	3	7		1		3		
4406	8	910		902	8	8	DIS. OF FEMALE GENITA	20	1	1	8		1		5	1	1
9704		610		578		33	HAND INJURY	13	1	3	9		1		1		3
7782	537		537				SLIPPED FEMORAL	14	2	1	9	1		4			
4405		2068		2008		60	BACK SPRAIN	15	2	3	9		3		17		1
1152		633		633			INTRACRANIAL INJURY	18	2	3	9		1		4		
1153	679		669		10		TONSILLITIS	15	2	1	11	1		4		1	
1159	602		574		28		TONSILLITIS	14	2	1	11	1		3		3	
1152	407	892	369	856	38	36	ACUTE URI PNEUMONIA	13	2	1	12	1	1	5	9	3	3
1153		1097		1209		68	DEVIATED SEPTUM	17	2	2	12		1		4		4
1159		1097		1209		68	DEVIATED SEPTUM	17	2	2	12		1		4		4

APPENDIX F

Detailed Tables of Costs Per Problem Type by Periodicity, Age, and Previous Cost History for Screen-Related Costs Incurred After Screening

Unit Costs for Screen-Related Costs After the Screen for All Those Children With Costs After Screens, but Had No Costs Prior to Screening for the Same Problem

Category Description	NUMBER: With Any Problem	NUMBER: With No Cost Before, but Had Cost After	COSTS AFTER: Any Problem	COSTS AFTER: Per Problem With Cost After, but No Cost Before
Dental	883	264 (320)	31.56 (69.70)	98.96 (94.26)
Vision	1056	155 (255)	4.56 (28.42)	49.97 (85.06)
Hearing	727	35	1.37 (22.43)	28.72 (36.57)
Hematocrit	727	14	0.72 (6.43)	36.36 (30.01)
Infective	727	6	0.22 (3.35)	27.17 (27.40)
Benign Neoplasm	727	2	0.34 (8.48)	123.00 (148.49)
Nutritional Deficiency	727	4	0.21 (3.17)	30.75 (28.98)
Blood	727	1	0.004 (0.11)	3.00 (-0-)
Mental, Emotional	727	3	1.38 (33.73)	322.67 (507.23)
Nervous System*	727	1	-0- (-0-)	-0- (-0-)
Heart	727	18	0.99 (8.09)	39.67 (34.16)
Respiratory	727	28	2.69 (27.18)	41.68 (56.74)
Digestive	727	4	1.82 (32.20)	328.50 (328.44)
Genitourinary	727	19	3.71 (36.81)	141.26 (184.79)
Pregnancy and Related Complications	727	1	0.66 (17.84)	481.00 (-0-)
Skin	727	9	0.33 (3.86)	26.89 (23.40)
Musculoskeletal	727	21	3.01 (53.54)	103.76 (305.07)
Birth Defects	727	6	0.44 (5.94)	48.00 (46.93)
Other	727	19	1.77 (25.72)	32.26 (24.88)
Tonsils & Adenoids	727	13	5.67 (56.25)	264.62 (298.86)
	727	(779)	61.45 (443.24)	77.72 (122.38)
		(204)		79.09 (180.3)

Unit Costs for Screen Related Problems After the Screen for Periodic Screens Only

	NUMBER				COSTS AFTER SCREENING			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	Problem	Problem Showing	Problem Showing Had Costs
Dental	395	268 (316)	164 (193)	141 (166)	33.25 (65.82)	49.00 (74.96)	80.07 (81.85)	93.14 (81.09)
Vision	549	174 (205)	130 (153)	117 (138)	4.23 (12.70)	24.66 (20.98)	32.95 (17.71)	36.66 (14.54)
Hearing	466	50	36	31	1.12 (11.40)	20.86 (45.82)	28.97 (52.27)	33.65 (5.10)
Hematocrit	466	20	16	4	0.41 (5.19)	9.60 (23.80)	12.00 (26.21)	48.00 (33.62)
Infective	466	12	12	10	0.74 (10.64)	28.58 (62.59)	28.58 (62.59)	34.30 (67.60)
Benign Neoplasm	466	2	1	-0-	-0-	-0- (-0-)	-0- (-0-)	-0- (-0-)
Nutritional Deficiency	466	15	9	3	0.10 (1.36)	3.00 (7.24)	5.00 (8.97)	15.00 (9.85)
Blood	466	18	13	3	0.09 (1.30)	2.39 (6.35)	3.31 (7.34)	14.33 (9.29)
Mental, Emotional	466	13	8	7	5.29 (82.72)	189.69 (476.69)	308.25 (589.72)	352.29 (622.60)
Nervous System*	466	1	1	1	0.17 (3.61)	78.00 (-0-)	78.00 (-0-)	78.00 (-0-)
Heart	466	34	25	14	2.18 (29.14)	29.94 (105.39)	40.72 (121.71)	72.71 (157.62)
Respiratory	466	29	27	17	0.95 (6.86)	15.31 (23.54)	16.44 (24.03)	26.12 (25.88)
Digestive	466	5	5	2	4.43 (93.46)	412.80 (897.01)	412.80 (897.01)	1032.00 (1393.00)
Genitourinary	466	22	15	13	3.50 (33.46)	74.05 (138.97)	108.60 (157.95)	125.31 (163.82)
Pregnancy and Related Complications	466	-0-	-0-	-0-	-0-	-0- (-0-)	-0- (-0-)	-0- (-0-)
Skin	466	13	8	6	0.31 (3.69)	11.00 (20.01)	17.88 (23.37)	23.83 (24.38)
Musculoskeletal	466	20	9	7	2.53 (49.07)	59.00 (235.41)	131.11 (347.83)	168.57 (392.36)
Birth Defects	466	7	6	5	4.69 (70.37)	312.14 (521.32)	364.17 (550.82)	437.00 (582.63)
Other	466	46	32	20	4.30 (42.25)	43.54 (129.23)	62.59 (151.69)	100.15 (183.26)
Tonsils & Adenoids	466	14	11	5	1.52 (28.53)	50.71 (162.57)	64.55 (182.69)	142.00 (264.00)
	466	842	580	452	69.81 (551.57)	42.90 (136.59)	62.21 (162.16)	75.52 (183.25)

Screen Related Unit Costs for Children With Original Screens

	NUMBER				COSTS AFTER				FOR JUST CHILDREN WITH NO $ BEFORE		
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Cost Per Problem With Cost	Number	Cost Per Child Wi One or Problem
Dental	883	497 (409)	336 (276)	285 (234)	31.56 (69.70)	56.07 (85.21)	82.80 (92.37)	97.61 (92.81)	98.96	264 (320)	$43.56
Vision	1,056	234 (161)	184 (126)	165 (113)	4.26 (28.39)	32.49 (72.43)	41.31 (79.45)	46.07 (82.61)	49.97	155 (255)	17.53
Hearing	727	84	6	42	0.76 (8.63)	14.55 (35.41)	23.04 (42.58)	42.54 (50.76)	28.72	35	1.38
Hematocrit	727	48	36	15	0.72 (6.43)	10.90 (22.93)	14.53 (25.53)	34.87 (29.49)	36.36	14	.70
Infective	727	20	16	6	0.22 (3.35)	8.15 (18.99)	10.19 (20.85)	27.17 (27.40)	27.17	6	.22
Benign Neoplasm	727	3	2	2	0.34 (8.48)	82.00 (126.76)	123.00 (148.49)	123.00 (148.49)	123	2	.34
Nutritional Deficiency	727	34	20	5	0.21 (3.17)	4.56 (14.16)	7.75 (17.95)	31.00 (25.10)	30.75	4	.17
Blood	727	20	12	1	0.004 (0.11)	0.15 (0.67)	0.25 (0.87)	3.00 (-0-)	3.00	1	.004
Mental, Emotional	727	23	11	5	1.38 (33.73)	43.57 (188.76)	91.09 (271.33)	200.40 (395.82)	322.67	3	1.33
Nervous System*	727	2	1	1	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	0	1	0
Heart	727	40	31	19	0.99 (8.09)	18.08 (30.03)	23.32 (32.34)	38.05 (33.93)	39.67	18	.98
Respiratory	727	57	46	34	2.69 (27.18)	33.77 (92.18)	41.85 (101.14)	56.62 (114.40)	41.68	28	1.61
Digestive	727	7	5	5	1.82 (32.20)	188.86 (290.31)	264.40 (318.51)	264.40 (318.51)	328.50	4	1.81
Genitourinary	727	45	28	20	3.71 (36.81)	59.87 (137.56)	96.21 (164.96)	134.70 (182.24)	141.26	19	3.69
Pregnancy and Related Complications	727	3	2	1	0.66 (17.84)	160.33 (277.71)	240.50 (340.12)	481.00 (-0-)	481	1	.66
Skin	727	32	21	9	0.33 (3.86)	7.56 (17.09)	11.52 (20.12)	26.89 (23.40)	26.89	9	.33
Musculos-keletal	727	45	29	22	3.01 (53.54)	48.58 (212.21)	75.38 (262.05)	99.36 (298.44)	103.76	21	2.99
Birth Defects	727	14	10	7	0.44 (5.94)	22.71 (37.74)	31.80 (41.67)	45.43 (43.38)	48.00	6	.40
Other	727	65	48	20	1.77 (25.72)	19.77 (84.51)	26.77 (97.64)	64.25 (145.09)	32.26	19	.84
Tonsils & Adenoids	727	26	22	17	5.67 (56.25)	158.46 (258.24)	187.27 (271.55)	242.35 (287.40)	264.62	13	4.73
	727	1,229	866	681							
		(1,138)	(748)	(578)	60.5	41.10 (103.78)	60.94 (123.57)	81.69 (134.97)			83.27

Age Group 13-21, All Screens
After Screen Only

	NUMBER				COSTS AFTER SCREENING			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	Problem	Problem Showing	Problem Showing and Had Costs
Dental	337	238	165	145	46.84 (89.26)	66.33 (99.99)	95.67 (107.81)	108.87 (108.59)
Vision	446	174 (227)	136 (177)	121 (157)	7.57 (41.23)	34.27 (82.51)	43.84 (91.11)	49.27 (95.22)
Hearing	342	25	15	9	0.61 (2.90)	8.28 (13.22)	13.80 (14.75)	23.00 (11.62)
Hematocrit	342	6	5	2	0.34 (4.92)	19.33 (34.80)	23.20 (37.43)	58.00 (39.60)
Infective	342	7	7	4	0.10 (1.02)	4.86 (5.67)	4.86 (5.67)	8.50 (4.80)
Benign Neoplasm	342	4	4	4	3.27 (48.03)	279.50 (399.12)	279.50 (399.12)	279.50 (399.12)
Nutritional Deficiency	342	21	12	3	0.16 (1.81)	2.62 (6.99)	4.58 (8.89)	18.33 (7.51)
Blood	342	9	7	2	0.05 (0.69)	2.00 (4.00)	2.57 (4.43)	9.00 (1.41)
Mental, Emotional	342	9	6	3	7.87 (105.88)	299.22 (616.25)	448.83 (725.98)	897.67 (844.55)
Nervous System*	342	3	2	1	0.23 (4.22)	26.00 (45.03)	39.00 (55.15)	78.00 (0)
Heart	342	11	8	6	0.34 3.07	10.55 (14.26)	14.50 (15.00)	19.33 (14.24)
Respiratory	342	15	10	5	0.33 (3.16)	7.60 (13.56)	11.40 (15.43)	22.80 (14.52)
Digestive	342	1	1	1	0.23 (0.43)	8.00 (0)	8.00 (0)	8.00 (0)
Genitourinary	342	28	23	17	3.93 (50.01)	48.00 (171.44)	58.44 (188.24)	79.06 (216.77)
Pregnancy and Related Complications	342	1	1	1	1.41 (26.01)	481.00 (0)	481.00 (0)	481.00 (0)
kin	342	14	7	5	0.45 (5.00)	11.07 (23.01)	22.14 (29.35)	31.00 (30.80)
usculos-keletal	342	14	8	7	0.89 (7.67)	21.64 (32.55)	37.88 (35.78)	43.29 (34.69)
irth Defects	342	3	3	3	3.32 (59.33)	379.00 (621.81)	379.00 (621.81)	379.00 (621.81)
ther	342	32	25	13	1.58 (12.88)	16.88 (39.49)	21.60 (43.68)	41.54 (54.02)
onsils & Adenoids	342	9	7	5	0.32 (3.46)	12.11 (18.68)	15.57 (20.06)	21.80 (20.83)
	342	(677)	(493)	(393)	76.84 (470.98)	47.55 (131.35)	65.25 (151.42)	81.80 (181.43)

Age Group 5-12, All Screens
After Screen Only

	NUMBER				COSTS AFTER SCREENING			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	Problem	Problem Showing	Problem Showing and Had Costs
Dental	650	450 (487)	290 (314)	244 (264)	34.41 (63.50)	49.71 (71.18)	76.97 (75.94)	91.48 (74.34)
Vision	804	216 (289)	166 (222)	151 (202)	4.08 (13.00)	26.51 (22.50)	34.50 (19.56)	37.92 (17.03)
Hearing	600	71	49	37	1.55 (17.44)	26.10 (67.87)	37.82 (79.40)	50.08 (88.37)
Hematocrit	600	25	16	4	0.24 (3.78)	5.68 (18.01)	8.88 (21.11)	35.50 (34.41)
Infective	600	14	10	6	0.21 (3.42)	9.14 (21.23)	12.80 (24.48)	21.33 (29.32)
Benign Neoplasm	600	3	1	1	0.09 (2.20)	18.00 (31.18)	54.00 (0)	54.00 (0)
Nutritional Deficiency	600	21	11	6	0.26 (3.46)	7.43 (17.37)	14.18 (22.32)	26.00 (25.05)
Blood	600	1	8	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Mental, Emotional	600	20	11	8	1.26 (17.18)	37.80 (88.61)	68.73 (112.16)	94.50 (123.23)
Nervous System*	600	0	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Heart	600	47	37	21	2.42 (26.75)	30.92 91.74	39.27 (102.06)	69.19 (128.75)
Respiratory	600	32	29	21	1.73 (14.93)	32.38 (57.32)	35.72 (59.27)	49.33 (64.91)
Digestive	600	6	6	5	4.63 (86.19)	462.50 (797.34)	462.50 (797.34)	555.00 (854.70)
Genitourinary	600	24	12	9	4.83 (45.02)	120.75 (195.41)	241.50 (219.16)	322.00 (192.04)
Pregnancy and Related Complications	600	0	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Skin	600	17	11	7	0.19 (1.93)	6.53 (9.81)	10.09 (10.69)	15.86 (9.16)
Musculoskeletal	600	33	17	11	4.56 (72.58)	82.97 (303.17)	161.06 (412.87)	248.91 (498.68)
Birth Defects	600	16	8	6	2.18 (43.43)	108.83 (300.10)	163.25 (362.45)	217.67 (411.96)
Other	600	54	39	21	3.23 (36.57)	35.93 (117.98)	49.74 (136.78)	92.38 (177.23)
Tonsils & Adenoids	600	19	14	9	5.07	160.00	217.14	337.78
	600	1,179	815	638	70.94 (505.96)	44.69 (119.32)	64.07 (138.11)	81.81 (152.61)

Age Group 0-4, All Screens
After Screen Only

		NUMBER			AFTER SCREENING			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	Problem	Problem Showing	Problem Showing and Had Costs
Dental	388	98 (107)	58 (63)	47 (51)	9.92 (40.98)	39.28 (74.41)	66.36 (87.14)	81.89 (90.05)
Vision	463	35 (46)	26 (34)	20 (26)	0.82 (6.19)	19.12 (23.83)	25.73 (24.39)	33.45 (26.77)
Hearing	353	45	40	31	2.15 (31.02)	33.71 (119.81)	37.92 (126.62)	48.94 (142.26)
Hematocrit	353	51	42	13	1.29 (8.52)	8.96 (20.99)	10.88 (22.71)	35.15 (28.95)
Infective	353	15	14	6	0.97 (12.31)	22.93 (57.20)	24.57 (58.99)	57.33 (82.42)
Benign Neoplasm	353	1	1	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Nutritional Deficiency	353	15	10	0	1.78 (33.53)	42.00 (162.67)	-0- (-0-)	-0- (-0-)
Blood	353	20	14	4	0.22 (2.39)	3.80 (9.57)	5.43 (11.15)	19.00 (13.95)
Mental, Emotional	353	10	3	1	0.05 (1.01)	1.90 (6.01)	6.33 (10.97)	19.00 (-0-)
Nervous System*	353	0	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Heart	353	20	14	6	0.49 (5.29)	8.60 (21.08)	12.29 (24.51)	28.67 (31.60)
Respiratory	353	54	47	33	4.21 (34.85)	26.96 (86.18)	30.98 (91.81)	44.12 (107.33)
Digestive	353	10	8	4	5.76 (81.73)	203.30 (465.45)	254.13 (513.60)	508.25 (665.80)
Genitourinary	353	18	10	8	2.80 (26.75)	54.83 (108.61)	98.70 (132.18)	123.38 (137.78)
Pregnancy and Related Complications	353	2	1	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Skin	353	25	21	6	0.52 (4.74)	7.28 (16.67)	8.67 (17.91)	30.33 (22.24)
Musculoskeletal	353	28	20	13	1.13 (8.30)	14.29 (26.54)	20.00 (29.67)	30.77 (32.17)
Birth Defects	353	8	7	4	0.20 (2.08)	9.00 (11.31)	10.29 (11.57)	18.00 (9.09)
Other	353	31	22	7	2.41 (36.00)	27.45 (120.39)	38.68 (142.31)	121.57 (243.15)
Tonsils & Adenoids	353	14	13	9	4.82 (50.23)	121.43 (230.35)	130.77 (236.98)	188.89 (268.12)
		(520)	(394)	(222)	39.54 (385.92)	30.73 (109.81)	45.34 (150.88)	68.96 (158.76)

APPENDIX G

Detailed Tables of Cost per Problem Type
by Periodicity, Age, and Previous Cost History
for Screening-Related Costs Both Before and After Screening.

Unit Costs for Screen-Related Costs After the Screen for All Those Children With Costs After Screens, but Had No Costs Prior to Screening for the Same Problem in States With Both Before and After Screening Costs Available

	NUMBER		COSTS AFTER	
Category Description	Any Problem	This Problem	Any Problem	This Problem
Dental	518	152 (217)	27.85 (59.40)	87.66 (78.72)
Vision	691	116 (221)	5.56 (35.83)	47.64 (98.09)
Hearing	362	20	1.11 (9.46)	35.35 (46.47)
Hematocrit	362	8	0.61 (4.71)	25.63 (19.66)
Infective	362	5	0.41 (4.67)	29.40 (30.02)
Benign Neoplasm	362	-0-	-0- (-0-)	-0- (-0-)
Nutritional Deficiency	362	4	0.34 (4.16)	30.75 (28.98)
Blood	362	1	0.01 (0.16)	3.00 (-0-)
Mental, Emotional	362	3	2.77 (47.80)	322.67 (507.23)
Nervous System*	362	-0-	-0- (-0-)	-0- (-0-)
Heart	362	10	0.76 (6.11)	27.50 (26.09)
Respiratory	362	15	3.73 (37.40)	41.93 (75.28)
Digestive	362	4	3.65 (45.60)	328.50 (328.44)
Genitourinary	362	18	6.99 (51.29)	140.06 (190.07)
Pregnancy and Related Complications	362	1	1.33 (25.28)	481.00 (-0-)
Skin	362	6	0.44 (4.74)	26.50 (28.18)
Musculoskeletal	362	8	0.90 (7.73)	39.63 (36.34)
Birth Defects	362	6	0.88 (8.40)	48.00 (46.93)
Other	362	12	2.73 (35.75)	26.25 (19.67)
Tonsils & Adenoids	362	9	8.25 (68.60)	256.22 (315.16)
	(362)	(568) (130)	68.32 (457.09)	70.97 (116.71) 82.77 (176.87)

Unit Costs for Screen Related Problems After and Before the Screen
for Periodic Screens Only

Category Description	NUMBER				COST AFTER				COST BEFORE			
	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost
Dental	221	113	70	57	20.76	40.61	65.56	80.51	3.86	7.55	3.47	4.16
		(149)	(92)	(75)	(52.91)	(68.46)	(77.12)	(78.13)	(19.41)	(26.69)	(12.63)	(13.91)
Vision	375	101	79	70	3.58	23.62	30.20	38.09	0.85	5.61	5.92	6.27
		(78)	(61)	(54)	(11.44)	(19.87)	(17.48)	(14.50)	(6.24)	(15.24)	(16.38)	(17.07)
Hearing	292	39	33	28	1.69	25.26	29.85	34.86	4.02	60.13	71.06	80.75
					(14.31)	(50.04)	(54.52)	(57.66)	(60.46)	(232.90)	(253.69)	(275.80)
Hematocrit	292	11	9	4	0.66	17.46	21.33	48.00	-0-	-0-	-0-	-0-
					(6.55)	(30.42)	(32.62)	(33.62)	(-0-)	(-0-)	(-0-)	(-0-)
Infective	292	12	12	10	1.17	28.58	28.58	34.30	-0-	-0-	-0-	-0-
					(13.43)	(62.59)	(62.59)	(67.60)	(-0-)	(-0-)	(-0-)	(-0-)
Benign Neoplasm	292	2	1	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
					(-0-)	(-0-)	(-0-)	(-0-)	(-0-)	(-0-)	(-0-)	(-0-)
Nutritional Deficiency	292	8	4	2	0.14	5.13	10.25	20.50	-0-	-0-	-0-	-0-
					(1.71)	(9.58)	(12.01)	(3.54)	(-0-)	(-0-)	(-0-)	(-0-)
Blood	292	17	13	3	0.15	2.53	3.31	14.33	0.02	0.35	-0-	-0-
					(1.64)	(6.52)	(7.34)	(9.29)	(0.35)	(1.46)	(-0-)	(-0-)
Mental, Emotional	292	11	7	6	8.14	216.00	339.43	396.00	6.71	178.09	274.86	268.67
					(104.32)	(517.03)	(629.81)	(670.16)	(84.25)	(415.89)	(508.01)	(556.21)
Nervous System*	292	1	1	1	0.27	78.00	78.00	78.00	0.09	27.00	27.00	27.00
					(4.56)	(-0-)	(-0-)	(-0-)	(1.58)	(-0-)	(-0-)	(-0-)
Heart	292	29	23	14	3.49	35.10	44.26	72.71	-0-	-0-	-0-	-0-
					(36.77)	(113.59)	(126.48)	(157.62)	(157.62)	(-0-)	(-0-)	(-0-)
Respiratory	292	24	24	16	1.40	17.08	17.08	25.63	1.83	22.21	22.21	30.69
					(8.41)	(24.80)	(24.80)	(26.64)	(18.13)	(60.72)	(60.72)	(73.32)
Digestive	292	5	5	2	7.07	412.80	412.80	1032.00	-0-	-0-	-0-	-0-
					(118.06)	(897.01)	(897.01)	(1393.00)	(-0-)	(-0-)	(-0-)	(-0-)
Genitourinary	292	19	15	13	5.58	85.74	108.60	125.31	0.09	1.42	1.80	2.08
					(42.15)	(146.54)	(157.95)	(163.82)	(1.58)	(6.19)	(6.97)	(7.49)
Pregnancy and Related Complications	292	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
					(-0-)	(-0-)	(-0-)	(-0-)	(-0-)	(-0-)	(-0-)	(-0-)
Skin	292	9	7	5	0.38	12.33	15.86	22.20	0.17	5.56	7.14	10.00
					(4.27)	(22.32)	(24.48)	(26.88)	(2.37)	(13.06)	(14.63)	(16.90)
Musculoskeletal	292	11	5	5	3.88	102.91	226.40	226.40	0.03	0.73	1.60	1.60
					(61.95)	(317.00)	(465.05)	(465.05)	(0.47)	(2.41)	(3.58)	(3.58)
Birth Defects	292	5	5	4	3.88	226.40	226.40	283.00	-0-	-0-	-0-	-0-
					(64.20)	(486.72)	(486.72)	(542.69)	(-0-)	(-0-)	(-0-)	(-0-)
Other	292	42	29	18	4.92	34.19	49.52	79.78	0.09	0.64	0.93	1.50
					(47.45)	(122.29)	(145.30)	(179.50)	(1.58)	(4.17)	(5.01)	(6.36)
Tonsils & Adenoids	292	11	9	4	2.37	63.00	77.00	173.25	0.24	6.27	6.78	6.00
					(36.03)	(183.21)	(201.85)	(293.96)	(2.19)	(9.88)	(10.79)	(12.00)
	292				70.06	44.66	60.72	83.94	18.00	13.69	16.01	19.61
		(483)	(255)	(264)	(630.16)	(166.09)	(193.16)	(231.39)	(198.61)	(98.21)	(114.75)	(132.40)
Without Dental & Vision		(256)	(202)	(135)	45.72	53.43	67.73	104.19	13.29	19.73	24.76	33.32
							(249.66)	(315.63)		(132.77)	(151.36)	(182.26)

Screen Related Unit Costs for Children With Original Screens

	NUMBER				COSTS AFTER				COST BEFORE			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost
Dental	518	266 (185)	198 (137)	169 (117)	27.85 (59.40)	54.23 (73.80)	72.62 (77.38)	85.08 (77.17)	3.27 (19.70)	6.37 (27.15)	6.66 (27.94)	6.34 (27.14)
Vision	691	158 (83)	134 (70)	126 (66)	5.55 (35.83)	37.01 (86.19)	43.64 (92.07)	46.42 (94.29)	2.33 (45.09)	15.51 (116.96)	6.94 (56.11)	7.39 (57.83)
Hearing	362	43	37	25	1.11 (9.46)	18.70 (35.12)	21.73 (37.14)	32.16 (41.62)	0.14 (1.69)	2.40 (6.66)	2.24 (6.49)	2.52 (6.95)
Hematocrit	362	22	18	9	0.61 (4.71)	9.96 (16.87)	12.17 (17.91)	24.33 (18.80)				
Infective	362	13	10	5	0.41 (4.67)	11.31 (22.85)	14.70 (25.31)	29.40 (30.02)	0.04 (0.84)	1.23 (4.44)	1.60 (5.06)	-0-
Benign Neoplasm	362	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Nutritional Deficiency	362	19	15	4	0.34 (4.16)	6.47 (17.49)	8.2 (19.44)	30.75 (3.15)	0.17 (3.15)	3.16 (13.77)	4.0 (15.49)	-0-
Blood	362	17	12	1	0.008 (0.16)	0.18 (0.73)	0.25 (0.87)	3.0 (0.0)	0.06 (1.12)	1.47 (5.13)	0.33 (1.16)	-0-
Mental, Emotional	362	11	8	5	2.77 (47.80)	91.09 (271.33)	125.25 (316.68)	200.40 (395.82)	0.27 (4.52)	8.10 (25.54)	12.25 (29.75)	19.60 (37.0)
Nervous System*	362	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Heart	362	24	18	10	0.76 (6.11)	11.46 (21.41)	15.28 (23.62)	27.50 (26.09)	-0-	-0-	-0-	-0-
Respiratory	362	30	27	19	3.73 (37.40)	44.97 (124.47)	49.96 (130.47)	71.00 (151.69)	8.36 (113.40)	100.93 (387.83)	112.15 (407.99)	54.00 (183.20)
Digestive	362	7	5	5	3.65 (45.60)	188.86 (290.31)	264.40 (318.51)	264.40 (318.51)	1.29 (24.49)	66.57 (176.13)	93.20 (208.40)	93.20 (208.40)
Genitourinary	362	35	24	19	6.99 (51.29)	72.31 (151.88)	105.46 (174.51)	133.21 (187.11)	1.02 (19.39)	10.54 (62.37)	15.38 (75.32)	19.42 (84.65)
Pregnancy and Related Complications	362	2	2	1	1.33 (25.28)	240.50 (340.12)	240.50 (340.12)	481.00 (0)	-0-	-0-	-0-	-0-
Skin	362	18	14	6	0.44 (4.74)	8.83 (19.97)	11.36 (22.15)	26.50 (28.18)	0.18 (2.06)	3.61 (8.75)	1.50 (5.61)	-0-
Musculos-keletal	362	21	13	9	0.90 (7.73)	15.43 (29.03)	24.92 (33.89)	36.00 (35.69)	0.06 (0.87)	1.05 (3.54)	1.69 (4.44)	0.78 (2.33)
Birth Defects	362	11	9	7	0.88 (8.40)	28.91 (40.68)	35.33 (42.58)	45.43 (43.38)	14.83 (233.16)	488.09 (1307.04)	596.56 (1436.19)	151.14 (399.89)
Other	362	43	32	13	2.73 (35.75)	22.95 (102.52)	30.84 (118.28)	75.92 (180.09)	0.23 (4.36)	1.93 (12.66)	2.59 (14.67)	6.39 (23.02)
Tonsils & Adenoids	362	17	15	13	8.25 (68.60)	175.63 (273.75)	199.07 (283.98)	229.69 (294.05)	0.23 (2.49)	4.82 (10.80)	5.47 (11.38)	6.81 (12.06)
	362	757 (601) (333)	591 (466) (259)	446 (334) (151)	68.01 34.61	43.49 (109.35) 39.13 (128.31)	58.18 (122.59) 55.68 (138.31)	77.99 (137.56) 86.30 (181.14)	32.48 (476.33) 26.88	15.87 (213.87) 21.23 (279.26)	18.02 (24.00) 27.02 (319.67)	13.44 (89.09) 21.58 (124.15)

Screen Related Unit Costs For:

AGE GROUP 13 - 21

ALL SCREENS - BEFORE AND AFTER

	NUMBER				COSTS AFTER				COSTS BEFORE			
Category Description	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost
Dental	172	108	81	72	38.83 (76.00)	61.84 (88.28)	82.46 (93.29)	92.76 (94.00)	4.85 (25.26)	7.72 (31.58)	6.84 (31.43)	7.69 (33.27)
Vision	281	103 (164)	87 (139)	78 (125)	8.85 (14.58)	39.37 (105.32)	46.61 (113.21)	51.99 (118.43)	3.72 (62.23)	16.56 (130.84)	3.24 (12.77)	3.61 (13.45)
Hearing	177	17	13	8	0.54 (3.95)	11.29 (14.75)	14.77 (15.22)	24.00 (11.82)	4.10 (72.53)	85.36 (333.17)	111.61 (382.19)	181.38 (481.43)
Hematocrit	177	2	2	2	0.66 (6.83)	58.00 (39.60)	58.00 (39.60)	58.00 (39.60)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Infective	177	6	6	4	0.19 (1.41)	5.67 (5.75)	5.67 (5.75)	8.50 (4.80)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Benign Neoplasm	177	1	1	1	0.07 (0.98)	13.00 (0)	13.00 (0)	13.00 (0)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Nutritional Deficiency	177	14	8	3	0.31 (2.50)	3.93 (8.34)	6.88 (10.30)	18.33 (7.51)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Blood	177	8	7	2	0.10 (0.96)	2.25 (4.20)	2.57 (4.43)	9.00 (1.41)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Mental, Emotional	177	4	4	3	15.21 (147.00)	673.25 (822.78)	673.25 (822.78)	897.67 (844.55)	7.86 (104.63)	348.00 (696.00)	348.00 (696.00)	464.00 (803.00)
Nervous System*	177	2	1	1	0.44 (5.86)	39.00 (55.15)	78.00 (0)	78.00 (0)	0.15 (2.03)	13.50 (19.09)	27.00 (0)	27.00 (0)
Heart	177	7	5	4	0.38 (2.97)	9.57 (12.48)	13.40 (13.01)	16.75 (12.29)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Respiratory	177	7	7	3	0.28 (2.73)	7.00 (12.79)	7.00 (12.79)	16.33 (16.20)	0.15 (1.95)	3.71 (9.83)	3.71 (9.83)	6.50 (13.00)
Digestive	177	1	1	1	0.05 (0.60)	8.00 (0)	8.00 (0)	8.00 (0)	2.63 (35.08)	466.00 (0)	466.00 (0)	466.00 (0)
Genitourinary	177	22	20	16	6.67 (68.41)	53.68 (191.25)	59.05 (200.24)	73.81 (222.76)	2.24 (27.80)	18.00 (78.61)	19.80 (82.41)	24.75 (92.05)
Pregnancy and Related Complications	177	1	1	1	2.72 (36.15)	481.00 (0)	481.00 (0)	481.00 (0)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Skin	177	8	4	4	0.65 (6.27)	14.38 (27.64)	28.75 (35.08)	28.75 (35.08)	0.23 (2.40)	5.13 (10.76)	2.75 (5.50)	2.75 (5.50)
Musculoskeletal	177	6	3	3	0.45 (3.43)	13.17 (14.57)	26.33 (3.22)	26.33 (3.22)	0.05 (0.60)	1.33 (3.27)	2.67 (4.62)	2.67 (4.62)
Birth Defects	177	3	3	3	6.42 (82.47)	379.00 (621.81)	379.00 (621.81)	379.00 (621.81)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Other	177	22	17	9	1.19 (6.61)	9.55 (16.80)	12.35 (18.27)	23.22 (19.47)	0.15 (2.03)	1.23 (5.76)	1.59 (6.55)	3.00 (9.00)
Tonsils & Adenoids	177	8	7	5	0.62 (4.79)	13.63 (19.37)	15.57 (20.06)	21.80 (20.83)	0.25 (2.10)	5.50 (8.80)	6.29 (9.20)	6.40 (10.43)
	177	(411) (139)	(330) (110)	(270) (73)	84.63 (474) 36.95	48.10 (153.16) 47.72 (223.54)	59.97 (168.93) 60.29 (249.81)	73.38 (184.63) 90.89 (301.99)	26.38 (338.59) 18.00	18.07 (136.25) 27.89 (183.07)	14.70 (121.65) 34.97 (207.63)	17.91 (137.23) 52.48 (259.66)

Screen Related Unit Costs For:

AGE GROUP 5 - 12
ALL SCREENS - BEFORE ANO AFTER

	NUMBER				COST AFTER				COST BEFORE			
Category Oescription	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost
Dental	358	228 (265)	161 (187)	135 (157)	30.82 (57.71)	48.39 (66.21)	68.24 (69.69)	81.38 (68.71)	4.55 (21.75)	7.15 (26.93)	5.74 (22.82)	4.97 (19.92)
Vision	512	138 (229)	114 (189)	105 (174)	4.65 13.63	27.63 (21.74)	33.44 (19.40)	36.31 (17.43)	0.89 (6.41)	5.34 (14.91)	5.26 (14.83)	5.15 (15.01)
Hearing	308	40	33	26	2.04 (16.52)	31.32 (58.58)	37.97 (62.75)	48.20 (67.32)	0.71 (10.32)	10.85 (40.07)	13.15 (43.89)	13.47 (47.96)
Hematocrit	308	7	5	3	0.46 (5.27)	20.29 (30.86)	28.40 (33.77)	47.33 (30.60)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Infective	308	11	8	6	0.42 (4.77)	11.64 (23.54)	16.00 (26.68)	21.33 (29.32)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Benign Neoplasm	308	1	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Nutritional Deficiency	308	8	7	4	0.39 (4.46)	15.00 (24.94)	17.14 (26.13)	30.00 (29.18)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Blood	308	11	8	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Mental, Emotional	308	13	9	7	2.16 (23.41)	51.23 (106.27)	74.00 (122.66)	95.14 (133.09)	1.77 (21.26)	41.92 (98.71)	60.56 (115.52)	33.29 (76.01)
Nervous System*	308	0	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Heart	308	34	27	16	3.54 (35.93)	32.09 (105.19)	40.41 (117.03)	68.19 (147.37)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Respiratory	308	18	16	13	2.43 (19.59)	41.61 (72.12)	46.81 (75.07)	57.62 (79.81)	1.55 (17.58)	26.50 (69.86)	29.81 (73.65)	36.69 (80.67)
Oigestive	308	6	6	5	9.01 (120.22)	462.50 (797.34)	462.50 (797.34)	555.00 (854.70)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Genitourinary	308	19	11	9	9.41 (62.54)	152.53 (208.99)	263.45 (215.57)	322.00 (192.04)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Pregnancy and Related Complications	308	0	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Skin	308	9	9	5	0.22 (1.88)	7.44 (8.63)	7.44 (8.63)	13.40 (7.02)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Musculos-keletal	308	15	7	5	3.61 (60.30)	74.20 (272.29)	159.00 (396.57)	222.60 (467.13)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Birth Defects	308	7	6	5	0.82 (8.80)	36.14 (49.76)	42.17 (51.64)	50.60 (52.92)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Other	308	40	29	16	4.56 (46.22)	35.13 (125.35)	48.45 (145.66)	87.81 (189.51)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Tonsils & Adenoids	308	10	8	5	6.29 (62.33)	193.60 (303.72)	242.00 (324.37)	387.20 (337.42)	0.24 (2.36)	7.30 (11.54)	8.13 (12.76)	8.00 (13.44)
	(308)	(743)	(565)	(456)	80.83	45.42	57.66	73.88	9.71	6.25	6.35	6.09
		(249)	(189)	(125)	(534.58)	(121.77)	(113.82)	(150.08)	(79.68)	(27.33)	(28.31)	(26.04)
					45.36	58.72 (196.64)	71.41 (180.72)	116.76 (268.22)	4.27	6.13 (35.28)	8.04 (40.64)	8.81 (40.64)

Screen Related Unit Costs For:

AGE GROUP 0 - 4
ALL SCREENS - BEFORE AND AFTER

Category Description	NUMBER				AFTER				BEFORE			
	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost	Any Problem	This Problem	This Problem Showed	This Problem Showed Had Cost
Dental	235	55 (65)	34 (40)	27 (32)	7.69 (28.60)	32.87 (51.97)	53.18 (57.51)	66.96 (56.92)	1.18 (13.18)	5.06 (27.07)	8.18 (34.25)	10.30 (38.29)
Vision	310	27 (42)	20 (31)	19 (29)	1.24 (7.62)	23.37 (24.79)	31.55 (23.89)	33.21 (23.30)	1.30 (26.77)	24.41 (127.50)	30.05 (152.24)	31.63 (156.04)
Hearing	200	27	25	20	0.9 (5.12)	13.33 (15.20)	14.40 (15.31)	18.00 (15.06)	1.41 (23.20)	20.85 (88.74)	21.72 (92.20)	26.15 (102.89)
Hematocrit	200	24	20	8	0.77 (4.34)	6.38 (11.22)	7.65 (11.92)	19.13 (11.62)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Infective	200	10	9	5	1.64 (16.30)	32.80 (68.86)	36.44 (72.01)	65.60 (89.32)	0.08 (1.13)	1.60 (5.06)	1.78 (5.33)	-0- (-0-)
Benign Neoplasm	200	1	1	1	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Nutritional Deficiency	200	9	6	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	0.30 (4.24)	6.67 (20.00)	10.00 (24.50)	-0- (-0-)
Blood	200	18	12	3	0.32 (3.04)	3.50 (9.82)	5.25 (11.79)	21.00 (16.37)	0.16 (1.57)	1.72 (5.09)	0.33 (1.56)	-0- (-0-)
Mental, Emotional	200	7	3	1	0.10 (1.34)	2.71 (7.18)	6.33 (11.00)	19.00 (-0-)	0.60 (6.49)	17.14 (32.64)	28.33 (49.08)	85.00 (-0-)
Nervous System*	200	0	0	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Heart	200	13	10	4	0.68 (6.66)	10.39 (25.04)	13.50 (28.10)	33.75 (38.17)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Respiratory	200	32	31	22	5.37 (45.34)	33.56 (110.54)	34.65 (112.20)	48.82 (131.37)	16.14 (152.77)	100.84 (375.50)	104.10 (381.25)	54.96 (172.07)
Digestive	200	6	4	2	3.06 (42.64)	102.00 (245.47)	153.00 (300.03)	306.00 (420.02)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Genitourinary	200	14	9	8	4.94 (35.43)	70.50 (119.32)	109.67 (135.29)	123.38 (137.78)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Pregnancy and Related Complications	200	1	1	0	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
Skin	200	11	9	3	0.53 (5.34)	9.55 (21.75)	11.67 (23.74)	35.00 (32.08)	0.37 (3.27)	6.73 (12.89)	6.67 (13.97)	13.00 (22.52)
Musculos-keletal	200	12	9	6	1.32 (10.07)	22.00 (36.60)	29.33 (39.99)	44.00 (42.25)	0.11 (1.67)	1.83 (4.61)	2.44 (5.25)	1.17 (2.86)
Birth Defects	200	7	6	4	0.36 (2.16)	10.29 (11.57)	12.00 (11.66)	18.00 (9.09)	26.85 (313.51)	767.00 (1611.73)	894.83 (1726.25)	264.50 (529.00)
Other	200	25	17	6	4.04 (47.72)	32.32 (133.89)	47.53 (161.62)	134.67 (263.64)	0.42 (5.87)	3.32 (16.60)	4.88 (20.13)	13.83 (33.89)
Tonsils & Adenoids	200	10	9	7	8.17 (66.51)	163.40 (263.87)	181.56 (273.17)	233.43 (292.18)	0.17 (2.40)	3.40 (10.75)	3.78 (11.33)	4.86 (12.85)
	200	(334)	(252)	(161)	41.13 (328.83)	29.14 (87.54)	38.57 (102.35)	60.37 (126.56)	49.09 (556.07)	32.79 (288.45)	42.71 (333.99)	26.55 (137.25)
Without Birth Defects	200	295	215	135	35.4	25.71 (85.66)	39.88 (102.16)	63.51 (127.29)	6.1	7.98 (57.96)	10.08 (69.32)	14.86 (86.07)
Without Dental and Vision	200	227	181	100	32.20	29.14 (101.87)	36.54 (117.03)	66.14 (155.99)	46.61	44.09 (358.63)	52.51 (388.18)	30.27 (150.31)
Without Dental and Vision	200	188	144	74	26.47	23.76 (102.07)	37.98 (120.30)	73.87 (165.75)	3.62	5.32 (36.28)	6.31 (41.85)	10.26 (56.57)

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